

Appendix L:

Data Forms and Photographs at 2013 and 2017 to 2019 WD Sites

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WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble Project Borough/City: Lake & Peninsula Sampling Date: 6/25/2013
Applicant/Owner: Pebble Limited Partnership Sampling Point: HDR2558
Investigators: Irina Lapina, Alena Gerlek Landform (hillslope, terrace, etc.): Mound
Local Relief (concave, convex, none): Convex Slope(%): 0
Subregion (LRR): _____ Lat: 59.301727 Long: -154.114695 Datum: WGS84
Soil Map Unit Name: IA17 NWI Classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)
Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ X _____ No _____
Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes _____	No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>			
Wetland Hydrology Present?	Yes _____	No <u>X</u>			

Remarks:
Amakdedori Creek at the coast. Antecedent precipitation is lower than normal.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:	
1.	_____	_____	_____	_____	Number of Dominant Species	
2.	_____	_____	_____	_____	That Are OBL, FACW, or FAC: _____ 3 (A)	
3.	_____	_____	_____	_____	Total Number of Dominant	
4.	_____	_____	_____	_____	Species Across All Strata: _____ 4 (B)	
Total Cover: _____					Percent of Dominant Species	
50% of total cover: _____ 0				20% of total cover: _____ 0	That Are OBL, FACW, or FAC: _____ 75 (A/B)	
Sapling/Shrub Stratum (Plot size:)					Prevalence Index worksheet:	
1.	Empetrum nigrum	95	Yes	FAC	Total % Cover of: _____ Multiply by: _____	
2.	Salix arctica	25	Yes	FACU	OBL species _____ x1= _____	
3.	Vaccinium vitis-idaea ssp. minus	5	No	FAC	FACW species _____ x2= _____ 0	
4.	Ledum decumbens	T	No	FAC	FAC species _____ 135 x3= _____ 405	
5.	_____	_____	_____	_____	FACU species _____ 35 x4= _____ 140	
6.	_____	_____	_____	_____	UPL species _____ 3 x5= _____ 15	
Total Cover: _____ 125					Column Totals: _____ 173 (A) _____ 560 (B)	
50% of total cover: _____ 62.5				20% of total cover: _____ 25	Prevalence Index = B/A= _____ 3.24	
Herb Stratum (Plot size:)					Hydrophytic Vegetation Indicators:	
1.	Elymus arenarius	25	Yes	FAC	X Dominance Test is >50%	
2.	Cornus suecica	10	Yes	FAC	Prevalence Index is ≤3.0	
3.	Epilobium angustifolium	5	No	FACU	Morphological Adaptations ¹ (Provide	
4.	Geranium erianthum	5	No	FACU	data in Remarks or on a separate sheet)	
5.	Artemisia arctica	3	No	NL	Problematic Hydrophytic Vegetation ¹ (Explain)	
6.	Solidago multiradiata	T	No	FACU		
7.	Festuca brachyphylla	T	No	NL		
8.	Poa arctica	T	No	FAC		
9.	Achillea millefolium s.l.	T	No	FACU		
10.	Trientalis europaea s.l.	T	No	FACU		
Total Cover: _____ 48						
50% of total cover: _____ 24				20% of total cover: _____ 9.6		
Plot size (radius, or length x width) _____ % Bare Ground _____					Hydrophytic Vegetation Yes <u>X</u> No _____	
% Cover of Wetland Bryophytes _____ % Cover of Bryophytes _____ (Where applicable)					Present?	

Remarks:
Trace of bare ground- animal activity, arctic ground squirrels.

SOIL

Sampling Point: HDR2558

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 2/2	100					Sandy Loam	hor:A1
4-5	2.5Y 6/1	100					Silt Loam	hor:E
5-15	10YR 3/3	100					Sandy Loam	hor:A2
16-20	7.5YR2.5/2	98	7.5YR2.5/2	2		M	Sandy Loam	hor:A/B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:
☐ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:
☐ Alaska Color Change (TA4)¶
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox With 2.5Y Hue

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology.
and an appropriate landscape position must be present unless disturbed or problematic.
¶Give details of color change in Remarks.

☐ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
☐ Other (Explain in Remarks)

Restrictive Layer (if present):
Type: _____
Depth (inches): N/A

Hydric Soil Present? Yes _____ No _____ X _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)
☐ Surface Water (A1)
☐ High Water Tables (A2)
☐ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible of Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Marl Deposits (B15)
☐ Hydrogen Sulfide Odor (C1)
☐ Dry Season Water Table (C2)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)
☐ Water-stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospjeres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ Microtopographic Relief (D4)
☐ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes _____ No _____ X _____ Depth (inches): _____
Water Table Present? Yes _____ No _____ X _____ Depth (inches): _____
Saturation Present? Yes _____ No _____ X _____ Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes _____ No _____ X _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Y Aerial Photographs

Remarks:

Additional Reference Data: Photos

Plot ID: HDR2558



Photo Name: HDR2558_2000_IMGP0012.JPG

Direction: N/A

Caption: Soils



Photo Name: HDR2558_2000_IMGP0013.JPG

Direction: N/A

Caption: Soils



Photo Name: HDR2558_2000_IMGP0014.JPG

Direction: N

Caption: Vegetation

Photo Name: HDR2558_2000_IMGP0015.JPG

Direction: E

Caption: Vegetation



Photo Name: HDR2558_2000_IMGP0016.JPG

Direction: S

Caption: Vegetation



Photo Name: HDR2558_2000_IMGP0017.JPG

Direction: W

Caption: Vegetation



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble Project Borough/City: Lake & Peninsula Sampling Date: 6/25/2013
 Applicant/Owner: Pebble Limited Partnership Sampling Point: HDR2559
 Investigators: Irina Lapina, Marc Auten Landform (hillslope, terrace, etc.): Valleybottom
 Local Relief (concave, convex, none): Concave Slope(%): 0
 Subregion (LRR): _____ Lat: 59.303198 Long: -154.117036 Datum: WGS84
 Soil Map Unit Name: IA17 NWI Classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ X _____ No _____
 Are Vegetation: Soil or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>		
Wetland Hydrology Present?	Yes <u>X</u>	No _____		

Remarks:
 Amakdedori Creek/Coast. Antecedent precipitation is lower than normal.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow Addendum for additional entries

Tree Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1.					Number of Dominant Species
2.					That Are OBL, FACW, or FAC: <u>5</u> (A)
3.					Total Number of Dominant Species Across All Strata: <u>5</u> (B)
4.					Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
Total Cover: _____					Prevalence Index worksheet:
50% of total cover: <u>0</u>					
20% of total cover: <u>0</u>					
Sapling/Shrub Stratum (Plot size:)					Total % Cover of:
1.	Salix barclayi (shrub)	40	Yes	FAC	Multiply by:
2.	Myrica gale	40	Yes	OBL	OBL species <u>40</u> x1= <u>40</u>
3.	Potentilla fruticosa	20	Yes	FAC	FACW species <u>10</u> x2= <u>20</u>
4.					FAC species <u>187</u> x3= <u>561</u>
5.					FACU species <u>15</u> x4= <u>60</u>
6.					UPL species _____ x5= <u>0</u>
Total Cover: <u>100</u>					Column Totals: <u>252</u> (A) <u>681</u> (B)
50% of total cover: <u>50</u>					<i>Prevalence Index = B/A =</i> <u>2.70</u>
20% of total cover: <u>20</u>					
Herb Stratum (Plot size:)					Hydrophytic Vegetation Indicators:
1.	Calamagrostis canadensis	85	Yes	FAC	<u>X</u> Dominance Test is >50%
2.	Iris setosa	30	Yes	FAC	<u>X</u> Prevalence Index is ≤3.0
3.	Cornus suecica	7	No	FAC	Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet)
4.	Rubus arcticus s.l.	5	No	FAC	Problematic Hydrophytic Vegetation ¹ (Explain)
5.	Epilobium angustifolium	5	No	FACU	
6.	Angelica lucida	5	No	FACU	
7.	Trientalis europaea ssp. arctica	5	No	FACU	
8.	Sanguisorba canadensis	5	No	FACW	
9.	Viola langsdorffii	5	No	FACW	
10.	Carex microchaeta s.l.	T	No	FAC	
Total Cover: <u>152</u>					
50% of total cover: <u>76</u>					
20% of total cover: <u>30.4</u>					
Plot size (radius, or length x width) _____ % Bare Ground _____					Hydrophytic Vegetation Present? Yes _____ X _____ No _____
% Cover of Wetland Bryophytes _____ % Cover of Bryophytes _____ (Where applicable)					

Remarks:
 With sweetgale as codominant. Sweetgale is not leafed out, late spring.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2/1	100					Silt Loam	hor:A1
2-6	10YR 6/3	95	10YR 4/6	5		M	Silt Loam	hor:E
6-16	7.5YR2.5/2	98	7.5YR3/4	2		M	Silt Loam	hor:A2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:
☐ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:
☐ Alaska Color Change (TA4)¶
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox With 2.5Y Hue

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology.
and an appropriate landscape position must be present unless disturbed or problematic.
¶Give details of color change in Remarks.

☐ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
☐ Other (Explain in Remarks)

Restrictive Layer (if present):
Type: _____
Depth (inches): N/A

Hydric Soil Present? Yes No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)
☐ Surface Water (A1)
☐ High Water Tables (A2)
☐ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible of Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Marl Deposits (B15)
☐ Hydrogen Sulfide Odor (C1)
☐ Dry Season Water Table (C2)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)
☐ Water-stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospjeres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☒ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ Microtopographic Relief (D4)
☒ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes No X Depth (inches): _____
Water Table Present? Yes No X Depth (inches): _____
Saturation Present? Yes No X Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes **X** No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Y Aerial Photographs

Remarks:

Myrica gale is not leafed out, late spring.

Additional Reference Data: Photos

Plot ID: HDR2559



Photo Name: HDR2559_2000_IMGP0018.JPG

Direction: N/A

Caption: Soils



Photo Name: HDR2559_2000_IMGP0019.JPG

Direction: N/A

Caption: Soils



Photo Name: HDR2559_2000_IMGP0020.JPG

Direction: N

Caption: Vegetation



Photo Name: HDR2559_2000_IMGP0021.JPG

Direction: E

Caption: Vegetation



Photo Name: HDR2559_2000_IMGP0022.JPG

Direction: S

Caption: Vegetation



Photo Name: HDR2559_2000_IMGP0023.JPG

Direction: W

Caption: Vegetation

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble Project Borough/City: Lake & Peninsula Sampling Date: 6/25/2013
 Applicant/Owner: Pebble Limited Partnership Sampling Point: HDR2560
 Investigators: Irina Lapina, Alena Gerlek Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): None Slope(%): 5
 Subregion (LRR): _____ Lat: 59.304433 Long: -154.118969 Datum: WGS84
 Soil Map Unit Name: IA17 NWI Classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)
 Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ X _____ No _____
 Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>		
Wetland Hydrology Present?	Yes _____	No <u>X</u>		

Remarks:
 Amakdedori Creek. Antecedent precipitation is lower than normal.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow Addendum for additional entries

Tree Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1.	_____	_____	_____	_____	Number of Dominant Species _____
2.	_____	_____	_____	_____	That Are OBL, FACW, or FAC: _____ 3 (A)
3.	_____	_____	_____	_____	Total Number of Dominant _____
4.	_____	_____	_____	_____	Species Across All Strata: _____ 3 (B)
Total Cover: _____					Percent of Dominant Species _____
50% of total cover: <u>0</u>					That Are OBL, FACW, or FAC: _____ 100 (A/B)
20% of total cover: <u>0</u>					
Sapling/Shrub Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1.	<u>Alnus incana ssp. tenuifolia (shrub)</u>	<u>90</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2.	<u>Sambucus racemosa</u>	<u>T</u>	<u>No</u>	<u>FACU</u>	OBL species <u>0</u> x1= <u>0</u>
3.	<u>Oplopanax horridus</u>	<u>T</u>	<u>No</u>	<u>FACU</u>	FACW species <u>7</u> x2= <u>14</u>
4.	_____	_____	_____	_____	FAC species <u>160</u> x3= <u>480</u>
5.	_____	_____	_____	_____	FACU species <u>10</u> x4= <u>40</u>
6.	_____	_____	_____	_____	UPL species _____ x5= <u>0</u>
Total Cover: <u>90</u>					Column Totals: <u>177</u> (A) <u>534</u> (B)
50% of total cover: <u>45</u>					Prevalence Index = B/A= <u>3.02</u>
20% of total cover: <u>18</u>					
Herb Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1.	<u>Athyrium filix-femina ssp. cyclosorum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2.	<u>Calamagrostis canadensis</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3.	<u>Rubus arcticus s.l.</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4.	<u>Sanguisorba canadensis</u>	<u>7</u>	<u>No</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
5.	<u>Epilobium angustifolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6.	<u>Trientalis europaea s.l.</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
7.	<u>Achillea millefolium s.l.</u>	<u>T</u>	<u>No</u>	<u>FACU</u>	
8.	<u>Equisetum arvense</u>	<u>T</u>	<u>No</u>	<u>FACU</u>	
9.	<u>Viola sp.</u>	<u>T</u>	<u>No</u>	<u>FAC</u>	
10.	<u>Angelica lucida</u>	<u>T</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>87</u>					
50% of total cover: <u>43.5</u>					
20% of total cover: <u>17.4</u>					
Plot size (radius, or length x width) _____ % Bare Ground _____					
% Cover of Wetland Bryophytes _____ % Cover of Bryophytes _____					
(Where applicable)					

Remarks:

SOIL

Sampling Point: HDR2560

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	7.5Y 2.5/1	100					Silt Loam	hor:A
2-8	2.5Y 5/3	97	7.5YR 5/6	2		M	Very Fine Sand	hor:E
8-16	10YR 2/1	60					Silt Loam	hor:B sand for 40% layer

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

Indicators for Problematic Hydric Soils³:

☐ Histosol or Histel (A1)

☐ Histic Epipedon (A2)

☐ Hydrogen Sulfide (A4)

☐ Thick Dark Surface (A12)

☐ Alaska Gleyed (A13)

☐ Alaska Redox (A14)

☐ Alaska Gleyed Pores (A15)

☐ Alaska Color Change (TA4)¶

☐ Alaska Alpine Swales (TA5)

☐ Alaska Redox With 2.5Y Hue

☐ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer

☐ Other (Explain in Remarks)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology.

and an appropriate landscape position must be present unless disturbed or problematic.

¶Give details of color change in Remarks.

Restrictive Layer (if present):

Type:

Depth (inches):

N/A

Hydric Soil Present?

Yes No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Secondary Indicators (2 or more required)

Primary Indicators (minimum of one required; check all that apply)

☐ Surface Water (A1)

☐ High Water Tables (A2)

☐ Saturation (A3)

☐ Water Marks (B1)

☐ Sediment Deposits (B2)

☐ Drift Deposits (B3)

☐ Algal Mat or Crust (B4)

☐ Iron Deposits (B5)

☐ Surface Soil Cracks (B6)

☐ Inundation Visible of Aerial Imagery (B7)

☐ Sparsely Vegetated Concave Surface (B8)

☐ Marl Deposits (B15)

☐ Hydrogen Sulfide Odor (C1)

☐ Dry Season Water Table (C2)

☐ Other (Explain in Remarks)

☐ Water-stained Leaves (B9)

☐ Drainage Patterns (B10)

☐ Oxidized Rhizospjeres along Living Roots (C3)

☐ Presence of Reduced Iron (C4)

☐ Salt Deposits (C5)

☐ Stunted or Stressed Plants (D1)

☐ Geomorphic Position (D2)

☐ Shallow Aquitard (D3)

☐ Microtopographic Relief (D4)

☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?

Yes No X

Water Table Present?

Yes No X

Saturation Present?

Yes No X

(includes capillary fringe)

Depth (inches):

Depth (inches):

Depth (inches):

Wetland Hydrology Present?

Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Y Aerial Photographs

Remarks:

Additional Reference Data: Photos

Plot ID: HDR2560



Photo Name: HDR2560_2000_IMGP0024.JPG

Direction: N/A

Caption: Soils



Photo Name: HDR2560_2000_IMGP0025.JPG

Direction: N/A

Caption: Soils



Photo Name: HDR2560_2000_IMGP0026.JPG

Direction: N

Caption: Vegetation



Photo Name: HDR2560_2000_IMGP0027.JPG

Direction: E

Caption: Vegetation



Photo Name: HDR2560_2000_IMGP0028.JPG

Direction: S

Caption: Vegetation



Photo Name: HDR2560_2000_IMGP0029.JPG

Direction: W

Caption: Vegetation



Photo Name: HDR2560_2000_IMGP0030.JPG

Direction: N/A

Caption: Vegetation



Photo Name: HDR2560_2000_IMGP0031.JPG

Direction: N/A

Caption: Vegetation

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble Project Borough/City: Lake & Peninsula Sampling Date: 6/30/2013
 Applicant/Owner: Pebble Limited Partnership Sampling Point: HDR7019
 Investigators: Shannon Morgan, Marc Auten Landform (hillslope, terrace, etc.): Valleybottom
 Local Relief (concave, convex, none): Concave Slope(%): 0
 Subregion (LRR): _____ Lat: 59.295046 Long: -154.120566 Datum: WGS84
 Soil Map Unit Name: IA17 NWI Classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)
 Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ X _____ No _____
 Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>		
Wetland Hydrology Present?	Yes _____	No <u>X</u>		

Remarks:
 Amakdedori. Antecedent precipitation is lower than normal.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____					Number of Dominant Species _____
2. _____					That Are OBL, FACW, or FAC: _____ 3 (A)
3. _____					Total Number of Dominant Species _____
4. _____					Species Across All Strata: _____ 3 (B)
Total Cover: _____					Percent of Dominant Species _____
50% of total cover: <u>0</u>					That Are OBL, FACW, or FAC: _____ 100 (A/B)
20% of total cover: <u>0</u>					
Sapling/Shrub Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>		<u>80</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Vaccinium uliginosum</u>		<u>30</u>	<u>Yes</u>	<u>FAC</u>	OBL species _____ x1= _____
3. <u>Salix arctica</u>		<u>20</u>	<u>No</u>	<u>FACU</u>	FACW species <u>10</u> x2= <u>20</u>
4. <u>Salix fuscescens</u>		<u>10</u>	<u>No</u>	<u>FACW</u>	FAC species <u>115</u> x3= <u>345</u>
5. _____					FACU species <u>20</u> x4= <u>80</u>
6. _____					UPL species <u>0</u> x5= <u>0</u>
Total Cover: <u>140</u>					Column Totals: <u>145</u> (A) <u>445</u> (B)
50% of total cover: <u>70</u>					Prevalence Index = B/A= <u>3.07</u>
20% of total cover: <u>28</u>					
Herb Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>		<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Geranium erianthum</u>		<u>T</u>	<u>No</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Artemisia arctica</u>		<u>T</u>	<u>No</u>	<u>NL</u>	Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet)
4. _____					Problematic Hydrophytic Vegetation ¹ (Explain)
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
Total Cover: <u>5</u>					¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
50% of total cover: <u>2.5</u>					
20% of total cover: <u>1</u>					
Plot size (radius, or length x width) _____ % Bare Ground _____					Hydrophytic Vegetation Present? Yes _____ X _____ No _____
% Cover of Wetland Bryophytes _____ % Cover of Bryophytes _____ (Where applicable)					

Remarks:

SOIL

Sampling Point: HDR7019

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 2/1	100					Sandy Loam	hor:A organics present in A
3-4	2.5Y 6/2	100					Silt Loam	hor:E ash
4-20	10YR 2/2	100					Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:
☐ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:
☐ Alaska Color Change (TA4)¶
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox With 2.5Y Hue

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology.
and an appropriate landscape position must be present unless disturbed or problematic.
¶Give details of color change in Remarks.

☐ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
☐ Other (Explain in Remarks)

Restrictive Layer (if present):
Type: _____
Depth (inches): N/A

Hydric Soil Present? Yes _____ No ☒ X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)
☐ Surface Water (A1)
☐ High Water Tables (A2)
☐ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible of Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Marl Deposits (B15)
☐ Hydrogen Sulfide Odor (C1)
☐ Dry Season Water Table (C2)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)
☐ Water-stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospjeres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ Microtopographic Relief (D4)
☐ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes _____ No ☒ X Depth (inches): _____
Water Table Present? Yes _____ No ☒ X Depth (inches): _____
Saturation Present? Yes _____ No ☒ X Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes _____ No ☒ X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Y Aerial Photographs

Remarks:

Additional Reference Data: Photos

Plot ID: HDR7019



Photo Name: HDR7019_7000_IMGP0290.JPG

Direction: N/A

Caption: Soils



Photo Name: HDR7019_7000_IMGP0291.JPG

Direction: N/A

Caption: Soils



Photo Name: HDR7019_7000_IMGP0292.JPG

Direction: N

Caption: Vegetation



Photo Name: HDR7019_7000_IMGP0293.JPG

Direction: E

Caption: Vegetation



Photo Name: HDR7019_7000_IMGP0294.JPG

Direction: S

Caption: Vegetation



Photo Name: HDR7019_7000_IMGP0295.JPG

Direction: W

Caption: Vegetation

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble Project Borough/City: Lake & Peninsula Sampling Date: 6/28/2013
 Applicant/Owner: Pebble Limited Partnership Sampling Point: HDR9446
 Investigators: Simon Wigren, Shannon Morgan Landform (hillslope, terrace, etc.): Terrace
 Local Relief (concave, convex, none): Convex Slope(%): 1
 Subregion (LRR): _____ Lat: 59.801681 Long: -154.947516 Datum: WGS84
 Soil Map Unit Name: IA7 NWI Classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation: Soil or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>		
Wetland Hydrology Present?	Yes _____ No <u>X</u>		

Remarks:
 Antecedent precipitation is lower than normal.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u>Betula papyrifera s.l. (trees)</u>	10	Yes	FACU	Number of Dominant Species _____
2. <u>Picea glauca</u>	10	Yes	FACU	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. _____				Total Number of Dominant Species _____
4. _____				Species Across All Strata: <u>4</u> (B)
Total Cover: <u>20</u>				Percent of Dominant Species _____
50% of total cover: <u>10</u>		20% of total cover: <u>4</u>		That Are OBL, FACW, or FAC: <u>50</u> (A/B)
Sapling/Shrub Stratum (Plot size:)				Prevalence Index worksheet:
1. <u>Ledum decumbens</u>	75	Yes	FAC	<u>Total % Cover of:</u> _____ <u>Multiply by:</u> _____
2. <u>Vaccinium uliginosum</u>	60	Yes	FAC	OBL species _____ x1= _____
3. <u>Vaccinium vitis-idaea ssp. minus</u>	30	No	FAC	FACW species _____ x2= <u>0</u>
4. <u>Salix bebbiana</u>	25	No	FAC	FAC species <u>190</u> x3= <u>570</u>
5. <u>Betula papyrifera s.l. (saplings)</u>	5	No	FACU	FACU species <u>28</u> x4= <u>112</u>
6. <u>Spiraea beauverdiana</u>	3	No	FACU	UPL species _____ x5= <u>0</u>
Total Cover: <u>198</u>				Column Totals: <u>218</u> (A) <u>682</u> (B)
50% of total cover: <u>99</u>		20% of total cover: <u>39.6</u>		<i>Prevalence Index = B/A=</i> <u>3.13</u>
Herb Stratum (Plot size:)				Hydrophytic Vegetation Indicators:
1. <u>Trientalis europaea ssp. arctica</u>	T	No	FACU	Dominance Test is >50% _____
2. _____				Prevalence Index is ≤3.0 _____
3. _____				Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) _____
4. _____				Problematic Hydrophytic Vegetation ¹ (Explain) _____
5. _____				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
Total Cover: <u>0</u>				Hydrophytic Vegetation Present? Yes _____ No _____ X _____
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
Plot size (radius, or length x width) _____		% Bare Ground _____		
% Cover of Wetland Bryophytes _____		% Cover of Bryophytes _____		
(Where applicable)				

Remarks:
 BBMP Code: MFW: Birch has been browsed and is multi-trunked. Fire approximately 10-15 yrs ago. Fire in 2003 (AK Fire Service)

SOIL

Sampling Point: HDR9446

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2								hor:Oi fibric
2-5								hor:Oe hemic
5-6	10YR 4/2	100					Silt Loam	hor:A ash mixed in
6-11	10YR 3/4	100					Loamy Sand	hor:Bw organic staining
11-18	10YR 4/4	100					Sandy Loam	hor:Bw GR

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4)¶	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology.	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	¶Give details of color change in Remarks.	

Restrictive Layer (if present):	
Type: _____	
Depth (inches): <u> N/A </u>	Hydric Soil Present? Yes <u> </u> No <u> </u> X <u> </u>

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Tables (A2)	<input type="checkbox"/> Oxidized Rhizospores along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <u> </u> No <u> </u> X <u> </u> Depth (inches): _____	Wetland Hydrology Present? Yes <u> </u> No <u> </u> X <u> </u>
Water Table Present? Yes <u> </u> No <u> </u> X <u> </u> Depth (inches): _____	
Saturation Present? Yes <u> </u> No <u> </u> X <u> </u> Depth (inches): _____	
(includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Y Aerial Photographs

Remarks:

Dissolved O2: 84.439537; H2O Temp:

Additional Reference Data: Photos

Plot ID: HDR9446



Photo Name: HDR9446_9000_IMGP0229.JPG

Direction: N/A

Caption: Soils



Photo Name: HDR9446_9000_IMGP0230.JPG

Direction: N/A

Caption: Soils



Photo Name: HDR9446_9000_IMGP0231.JPG

Direction: N

Caption: Vegetation



Photo Name: HDR9446_9000_IMGP0232.JPG

Direction: E

Caption: Vegetation



Photo Name: HDR9446_9000_IMGP0233.JPG

Direction: S

Caption: Vegetation



Photo Name: HDR9446_9000_IMGP0234.JPG

Direction: W

Caption: Vegetation

Archer Lat: N 59. 33746 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5000-17Archer Long: W 154. 26949Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halsey 2) Dalzell 3) _____
 Bear Guard: D. G. 38 Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/15/2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska

Subregion: Western/Interior

Field Map: 30 map date: 8/11/17Township: 10S Range: 30WSection: 1 S.M. Quad No.: Iliamna B-4

General Location (opt): _____

Site marked on map? Y

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Emp nig</u>	S	FAC	30			13. <u>Rhox cam</u>	S	NL	5		
2. <u>Rho. Eom.</u>	S	FAC	10			14. <u>Lag gla</u>	H	NL	T		
3. <u>Vac ul.</u>	S	FAC	10			15. <u>Dia lap</u>	S	NL	T		
4. <u>Bet nam</u>	S	FAC	5			16. <u>Vac v. t</u>	S	FAC	10		
5. <u>Sal arc</u>	S	FACU	10			17.					
6. <u>Carex big</u>	H	FAC	T			18.					
7. <u>Salix phl.</u>	S	FACU	15			19.					
8. <u>Poa arc</u>	H	FAC	T			20.					
9. <u>Aln vir.</u>	S	FAC	T			21.					
10. <u>Arn. les.</u>	H	NL	T			22. lichen	10				
11. <u>Lol. pro.</u>	S	FACU	5			23. moss (feather / sphagnum)	35	white			
12. <u>Arc alp</u>	S	FACU	5			24. bare ground	15				

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species <u>0</u>	X1= <u>0</u>
FACW species <u>0</u>	X2= <u>0</u>
FAC species <u>65</u>	X3= <u>195</u>
FACU species <u>10</u>	X4= <u>40</u>
UPL + NL species <u>5</u>	X5= <u>25</u>
Column Totals: <u>80</u> (A)	<u>260</u> (B)
Prevalence Index = B/A=	<u>3.25</u>

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: DESTJDWet Code: JENWI Code: J

Hydrophytic Vegetation Indicators

Y Dominance Test is >50%Y Prevalence Index is ≤3.0Y Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S = 80/40 / 160 H = T

Hydrology

Observations (Measured from ground surface):

Surface Water Present? Y (N)
 Depth of Surface Water: _____
 Water Table Present? (Y) N
 Depth to Water Table: 21"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____"
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____"
 Saturated Soil Present? (Y) N
 Depth to saturation 19"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

Y Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
Y Water Marks (B1)
Y Sediment Deposits (B2)
Y Drift Deposits (B3)
Y Algal Mat or Crust (B4)
Y Marl Deposits (B15)
Y Iron Deposits (B5)
Y Surface Soil Cracks (B6)
Y Inundation Visible on Aerial Imagery (B7)
Y Sparsely Vegetated Concave Surface (B8)
Y Hydrogen Sulfide Odor (C1)
Y Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
Y Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

Y Water-Stained Leaves (B9)
Y Drainage Patterns (B10)
Y Oxidized Rhizospheres on Living Roots (C3)
Y Presence of Reduced Iron (C4)
Y Salt Deposits (C5)
Y Stunted or Stressed Plants (D1)
Y Geomorphic Position (D2)
Y Shallow Aquitard (D3) (≠ frost)
Y Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: E (cardinal) Slope: 10 %HGM Class: NA Landform: Footslope Macrotopo (in poly): Flat Microtopo: Hummocky (small)Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y N

Soils

PLOT NO: HDR 5000-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: *mwD*

Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description:

Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.





²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☐ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- | | |
|---|--------------------------------------|
|  | Alaska Color Change (TA4) |
|  | Alaska Alpine Swales (TA5) |
|  | Alaska Redox with 2.5Y Hue (4a3) |
|  | Alaska Gleyed w/out Hue 5Y or Redder |
| Underlying layer (4a4) | |

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- Soils with Low Organic Carbon Content (4b1)
Soils with Low Weatherable Iron Content (4b2)
Soil pH Greater than 7.2 (4b3)
Recently Developed Wetland (4b4)
Positive α, α Test (60% of 4" layer) (4c)
Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$
from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

Profile moist but not saturated above 19."

Other Soil Observations:

Major Rooting Zone: 11 in.

Cryoturbated? Y ☒ N

Thixotropic? ☒ Y ☐ N

Hydric Soils?

Y N

Wetland Determination

Hydrophytic Vegetation Present?

☒ Yes ☐ No

Wetland Hydrology Present?

Yes ☒ No

Hydric Soils Present?

Yes ☒ No ☐

Plot Meets Wetland Criteria?

Yes Yes-Transitional No No-Transitional

Remarks:

Archer # _____	Photo # _____	Subject _____	Bearing _____
Ricoh # _____	_____	_____	_____
(4 veg photos in each	40	Veg	NE
direction, if different;	41	Veg	SW
2 soil photos: soil	42	SOIL	_____
Profile and above pit)	V3	SOIL	_____



Plot Number: HDR5000_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR5000_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR5000_17 Description: Soil Date: 8/15/2017



Plot Number: HDR5000_17 Description: Soil Date: 8/15/2017

Archer Lat: N 59. 33731 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 500/17Archer Long: W 154. 26883Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halstead 2) Dalzell 3) _____
 Bear Guard: GUST Observer: _____
 Do 'Normal Circumstances' Exist? (YES) NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES (NO)
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES (NO)
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/15/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 30 map date: 8/11/2017
 Township: 105 Range: 32W
 Section: 1 S.M. Quad No.: 21, B-4
 General Location (opt): _____
 Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
① <u>Ain vir</u>	<u>S</u>	<u>FAC</u>	<u>60</u>	<u>25</u>		13.					
② <u>Cal can</u>	<u>H</u>	<u>FAC</u>	<u>20</u>			14.					
③ <u>Lyc ann (Spi. ann.)</u>	<u>H</u>	<u>FACU</u>	<u>10</u>			15.					
4. <u>DMY ex D</u>	<u>H</u>	<u>FACU</u>	<u>5</u>			16.					
5. <u>Tri. eur. eur</u>	<u>H</u>	<u>FACU</u>	<u>3</u>			17.					
⑥ <u>mo. lat (Herb)</u>	<u>H</u>	<u>FACU</u>	<u>1</u>			18.					
7. <u>Ang luc</u>	<u>H</u>	<u>FACU</u>	<u>1</u>			19.					
8. <u>Cha ang</u>	<u>H</u>	<u>FACU</u>	<u>1</u>			20.					
9.						21.					
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species 0 X1= 0
 FACW species 0 X2= 0
 FAC species 80 X3= 240
 FACU species 18 X4= 72
 UPL + NL species 0 X5= 0
 Column Totals: 98 (A) 312 (B)
 Prevalence Index = B/A= 3.18

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 66.6 (A/B)

Project Veg Type: OALS
 JDWet Code: U
 ENWI Code: U
 Hydrophytic Vegetation Indicators
 X Dominance Test is >50%
 N Prevalence Index is ≤3.0
 - Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
(Y) N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S=60/30/12 H=38/19/7.6

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y (N)
 Depth of Surface Water: _____
 Water Table Present? Y (N)
 Depth to Water Table: _____
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y (N)
 Depth to saturation _____
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
1 High Water Table (A2)
1 Saturation (A3)
1 Water Marks (B1)
1 Sediment Deposits (B2)
1 Drift Deposits (B3)
1 Algal Mat or Crust (B4)
1 Marl Deposits (B15)
1 Iron Deposits (B5)
1 Surface Soil Cracks (B6)
1 Inundation Visible on Aerial Imagery (B7)
1 Sparsely Vegetated Concave Surface (B8)
1 Hydrogen Sulfide Odor (C1)
1 Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
1 Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)
1 Drainage Patterns (B10)
1 Oxidized Rhizospheres on Living Roots (C3)
1 Presence of Reduced Iron (C4)
1 Salt Deposits (C5)
1 Stunted or Stressed Plants (D1)
1 Geomorphic Position (D2)
1 Shallow Aquitard (D3) (≠ frost)
1 Micro-topographic Relief (D4)
1 FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: E (cardinal) Slope: 9 %Local relief: concave / convex (none)HGM Class: None Landform: Topslope Macrotopo (in poly): Flat Microtopo: Hummocky (mod)Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

(Y) (N)

Soils

PLOT NO: HDR 5001-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: well drained Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-1	Oi												
1-2	Oe												
2-3	E	10YR 6/2	100	Sandy Loam									
3-15	A	7.5YR 2.5/2	100	Sandy Loam									

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:Boulders 50% throughout
Shovel refusal @ 15"**Other Soil Observations:**Major Rooting Zone: 0-5 in.Cryoturbated? Y NThixotropic? Y N**Hydric Soils?**Y N**Wetland Determination**Hydrophytic Vegetation Present? Yes NoWetland Hydrology Present? Yes NoHydric Soils Present? Yes NoPlot Meets Wetland Criteria? Yes Yes-Transitional No No-Transitional**Remarks:**

Archer #	Photo #	Subject	Bearing
Ricoh # <u>0N1X</u>	<u>36</u>	<u>veg</u>	<u>SE</u>
(4 veg photos in each direction, if different;	<u>37</u>	<u>veg</u>	<u>NE</u>
2 soil photos: soil	<u>38</u>	<u>SOIL</u>	
Profile and above pit)	<u>39</u>	<u>SOIL</u>	



Plot Number: HDR5001_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR5001_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR5001_17 Description: Soil Date: 8/15/2017



Plot Number: HDR5001_17 Description: Soil Date: 8/15/2017

Archer Lat: N 59.33801 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5003-17

Archer Long: W 154.154,265916

Wetland? ☒ Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halstead 2) Dalzell 3) _____
 Bear Guard: Gust Observer: _____
 Do 'Normal Circumstances' Exist? ☒ YES ☐ NO
 Is the Site Significantly Disturbed (Atypical Situation)? ☒ YES ☐ NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? ☒ YES ☐ NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/15/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 30 map date: _____
 Township: 10S Range: 30W
 Section: 1 S.M. Quad No.: ILI-B4
 General Location (opt): _____
 Site marked on map? ☒ X

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) @ for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. Vac. ul.	S	FAC	20			13. Cal. can.	H	FAC	5		
2. Sal. fus.	S	FACW	5			14. Cor. sue.	H	FAC	T		
3. Eri. ang.	H	OBL	50			15. Tri. sed.	H	FAC	T		
4. Rub. cha.	H	FACW	10			16.					
5. Pot. pal. (comp. l.)	H	OBL	T			17.					
6. Bet. nan.	S	FAC	5			18.					
7. Rho. tom.	S	FAC	5			19.					
8. Eri. ar.	H	FAC	5			20.					
9. Eri. alg.	S	FAC	10			21.					
10. Tri. ces.	H	OBL	15			22. lichen					
11. Carex. flora	H	OBL	10			23. moss (feather / sphagnum)					
12. A. n. vit.	S	FAC	T			24. bare ground					

Prevalence Index worksheet:

Total % Cover of Multiply by:
 OBL species 75 X1= 75
 FACW species 15 X2= 30
 FAC species 50 X3= 150
 FACU species 0 X4= 0
 UPL + NL species 0 X5= 0
 Column Totals: 140 (A) 255 (B)
 Prevalence Index = B/A = 1.82

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: SSMWA - and
 JDWet Code: W
 ENWI Code: PEMIC
 Hydrophytic Vegetation Indicators
☒ Dominance Test is >50%
☒ Prevalence Index is ≤3.0
☒ Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
☒ Y ☐ N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Des. res. located out of plot.

S = 45/22.5/9

H = 95/47.5/19

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? ☒ Y ☐ N
 Depth of Surface Water: 2" in low areas
 Water Table Present? ☒ Y ☐ N
 Depth to Water Table: 8"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y ☒ N
 If Y, depth to Layer: "
 Restrictive Layer Type: "
 If lateral flow, at what depth? "
 Saturated Soil Present? ☒ Y ☐ N
 Depth to saturation: 0" - surface
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 5 (total)

☒ Surface Water (A1)
☒ High Water Table (A2)
☒ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Marl Deposits (B15)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Hydrogen Sulfide Odor (C1)
☐ Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
 Other (explain in Hydrology Comments)

Secondary Indicators 4 (total)

☐ Water-Stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospheres on Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2) - Depression
☐ Shallow Aquitard (D3) (≠ frost)
☐ Micro-topographic Relief (D4)
☐ FAC-Neutral Test (D5) some hummocks

Hydrology Comments:

Aspect: N/A (cardinal) Slope: 0%

Local relief: concave/convex/none

HGM Class: Depressional Landform: Trenchlike Macrotopo (in poly): slight conc. Microtopo: hum-small

Are climatic/hydrologic conditions at the site typical for this time of year? ☒ Y ☐ N Unknown (Explain if N or Unknown)

Wetland Hydrology?
☒ Y ☐ N

Soils

PLOT NO: HDR 5003-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: PD Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-3	Di	-											
3-5	Oe	-											
5-7	C	5Y 7/2	95	VFSALO	C	5YR 4/6	5	MRL		F			Ash
7-11	Oe6	-											
11-19	B	2.5Y 5/2	100	SALO									

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4) - @ 5"
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:**Other Soil Observations:**Major Rooting Zone: 5" in.Cryoturbated? Y ☒Thixotropic? Y ☒**Hydric Soils?**☒ Y ☐ N**Wetland Determination**Hydrophytic Vegetation Present? ☒ Yes ☐ NoWetland Hydrology Present? ☒ Yes ☐ NoHydric Soils Present? ☒ Yes ☐ NoPlot Meets Wetland Criteria? ☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional**Remarks:**

Archer #	Photo #	Subject	Bearing
Ricoh #	48	Soil	
(4 veg photos in each direction, if different;	49	Soil	
2 soil photos: soil	50	N	
Profile and above pit)	51	E	
	52	S	
	53	W	



Plot Number: HDR5003_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR5003_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR5003_17 Description: Soil Date: 8/15/2017



Plot Number: HDR5003_17 Description: Soil Date: 8/15/2017

Archer Lat: N 59. 33.760 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5005-17Archer Long: W 154. 26570Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halstead 2) Dalzell 3) _____
 Bear Guard: GUST Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/15/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: _____ map date: _____
 Township: 105 Range: 30W
 Section: 1 S.M. Quad No.: ILI-13-4
 General Location (opt): _____
 Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
① Emp nig	S	FAC	60			⑬ Sanguisorba can	H	FACW	T		
② Vac uli	S	FAC	30			14.					
③ Car big	H	FAC	25			15.					
4. Sal ret	S	FAC	5			16.					
⑤ Rub cha	H	FACW	10			17.					
6. Bet nam	S	FAC	5			18.					
⑦ Sal put.	S	FAC	3			19.					
8. Cha ung	H	FACU	5			20.					
9. Cof sor	H	FAC	T			21.					
10. Led dpl (Rho. ten.)	S	FAC	5			22. lichen					
11. Cal cm	H	FAC	5			23. moss (feather / sphagnum)					
12. Angelica luc	H	FACU	T			24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by:
 OBL species 0 X1= 0
 FACW species 10 X2= 20
 FAC species 138 X3= 414
 FACU species 5 X4= 20
 UPL + NL species 0 X5= 0
 Column Totals: 153 (A) 454 (B)
 Prevalence Index = B/A= 2.97

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: DEST-CJDWet Code: JENWI Code: J

Hydrophytic Vegetation Indicators

Y Dominance Test is >50%Y Prevalence Index is ≤3.0Y Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S = 108/54/21.6 H = 45/22.5/9

Hydrology

Observations (Measured from ground surface):

Surface Water Present? Y (N)
 Depth of Surface Water: _____
 Water Table Present? Y (N)
 Depth to Water Table: _____
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y (N)
 Depth to saturation _____
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
/ High Water Table (A2)
/ Saturation (A3)
/ Water Marks (B1)
/ Sediment Deposits (B2)
/ Drift Deposits (B3)
/ Algal Mat or Crust (B4)
/ Marl Deposits (B15)
/ Iron Deposits (B5)
/ Surface Soil Cracks (B6)
/ Inundation Visible on Aerial Imagery (B7)
/ Sparsely Vegetated Concave Surface (B8)
/ Hydrogen Sulfide Odor (C1)
/ Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
 Other (explain in Hydrology Comments)

Secondary Indicators 1 (total)

N Water-Stained Leaves (B9)
/ Drainage Patterns (B10)
/ Oxidized Rhizospheres on Living Roots (C3)
/ Presence of Reduced Iron (C4)
/ Salt Deposits (C5)
/ Stunted or Stressed Plants (D1)
/ Geomorphic Position (D2)
/ Shallow Aquitard (D3) (≠ frost)
/ Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

soil moist but not saturated

Aspect: E (cardinal) Slope: 3 % Local relief: concave / convex none
 HGM Class: 1A Landform: tree slope Macrotopo (in poly): flat Microtopo: hummock (mud)
 Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y (N)

Soils

PLOT NO: HDR 5505-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: well drained Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-3	Oe												
3-4	E	10YR6/2	100	VF-SaL									
4-5	A1	7.5YR3/1	100	SiL									
5-20	A2	7.5YR3/2	50	GL								N	
		7.5YR3/3	50	GL								N	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
☒ Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

15% cobbles throughout

Other Soil Observations:Major Rooting Zone: 6 in.Cryoturbated? Y NThixotropic? Y N**Hydric Soils?**Y N**Wetland Determination**Hydrophytic Vegetation Present? Yes NoWetland Hydrology Present? Yes NoHydric Soils Present? Yes NoPlot Meets Wetland Criteria? Yes Yes-Transitional No No-Transitional**Remarks:**

Archer #	Photo #	Subject	Bearing
Ricoh #	58	SOIL	
(4 veg photos in each direction, if different;	59	SOIL	
2 soil photos: soil	60	N	
Profile and above pit)	61	E	
	62	S	
	63	W	



Plot Number: HDR5005_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR5005_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR5005_17 Description: Soil Date: 8/15/2017



Plot Number: HDR5005_17 Description: Soil Date: 8/15/2017

Archer Lat: N 59. 33916 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5008-17Archer Long: W 154. 26239Wetland? (Y) Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halstead 2) Dalzell 3) _____
 Bear Guard: Gust Observer: _____
 Do 'Normal Circumstances' Exist? (YES) (NO)
 Is the Site Significantly Disturbed (Atypical Situation)? (YES) (NO)
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? (YES) (NO)
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/15/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 30 map date: _____
 Township: 105 Range: 30W
 Section: 1 S.M. Quad No.: 14E-B4
 General Location (opt): _____
 Site marked on map? X

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Aln. vir.</u>	<u>S</u>	<u>FAC</u>	<u>10</u>	<u><5</u>	<u>23</u>	13. <u>Rub. cha.</u>	<u>H</u>	<u>FACW</u>	<u>T</u>		
2. <u>Sal. pic.</u>	<u>IS</u>	<u>FACW</u>	<u>15</u>			14. <u>Viola gorgoe</u>	<u>IT</u>	<u>FACW</u>	<u>5</u>		
3. <u>Sp. uer. (Spi. ste.)</u>	<u>S</u>	<u>FACW</u>	<u>T</u>			15. <u>Iri. set.</u>	<u>IT</u>	<u>FAC</u>	<u>5</u>		
4. <u>Sal. pic.</u>	<u>IS</u>	<u>FAC</u>	<u>15</u>			16.					
5. <u>Rub. spe.</u>	<u>S</u>	<u>FACW</u>	<u>5</u>			17.					
6. <u>Bet. nan.</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			18.					
7. <u>Vac. uli.</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			19.					
8. <u>Cor. sue.</u>	<u>H</u>	<u>FAC</u>	<u>T</u>			20.					
9. <u>Cal. can.</u>	<u>H</u>	<u>FAC</u>	<u>15</u>			21.					
10. <u>Cha. ang.</u>	<u>H</u>	<u>FACW</u>	<u>5</u>			22. lichen					
11. <u>Ger. eri.</u>	<u>H</u>	<u>FACW</u>	<u>T</u>			23. moss (feather / sphagnum)					
12. <u>San. can.</u>	<u>H</u>	<u>FACW</u>	<u>T</u>			24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by: _____
 OBL species 0 X1= 0
 FACW species 20 X2= 40
 FAC species 55 X3= 165
 FACU species 10 X4= 40
 UPL + NL species 0 X5= 0
 Column Totals: 85 (A) 245 (B)
 Prevalence Index = B/A = 2.88

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)
 Total Number of Dominant Species Across All Strata: 6 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 83.3 (A/B)

Project Veg Type: CAWLSJDWet Code: BWENWI Code: PS1/EM1B

Hydrophytic Vegetation Indicators

X Dominance Test is >50%Y Prevalence Index is ≤3.07 Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

(Y) N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Plot size 10' x 20'. + capture shallow valley bottom.
S=55/27.5/11 H=30/15/6

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? (Y) N few
 Depth of Surface Water: 1" in low areas
 Water Table Present? (Y) N
 Depth to Water Table: 7"
 Just seeping in at this level, not yet filled to this level? (check if yes) (X)
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? (Y) N
 Depth to saturation 5"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 3 (total)

Y Surface Water (A1) - in low areas
Y High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 2 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
Y Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: SE (cardinal) Slope: 5 %Local relief: concave / convex / noneHGM Class: Slope Landform: VB Macrotopo (in poly): Concave Microtopo: Hum modAre climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

(Y) N

Soils

PLOT NO: HDR 5008-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: PD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Color(s)	Matrix (%)	Texture	Type ¹	Color	Redox Features (%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-3	Oe	-											
3-7	Oe/c	2.5Y 6/2	70	FSALO	C	7.5YR 3/2	10	m		m		N	*Ash w/ ~20% organics
7-9	Oab												
9-10	Cb	2.5Y 5/2	95	FSALO	C	10YR 4/2	5	RC		F		N	Ash
10-21	Ab	10YR 3/2	60									N	
		10YR 3/3	40									N	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ Histosol or Histel (A1)
- ☒ Histic Epipedon (A2)
- ☒ Hydrogen Sulfide (A4)
- ☒ Thick Dark Surface (A12)
- ☒ Alaska Gleyed (A13)
- ☒ Alaska Redox (A14)
- ☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
- ☒ Alaska Alpine Swales (TA5)
- ☒ Alaska Redox with 2.5Y Hue (4a3)
- ☒ Alaska Gleyed w/out Hue 5Y or Redder Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
- ☒ Soils with Low Weatherable Iron Content (4b2)
- ☒ Soil pH Greater than 7.2 (4b3)
- ☒ Recently Developed Wetland (4b4)
- ☒ Positive α,α Test (60% of 4" layer) (4c)
- ☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

*Organic inclusions in horizon.

Other Soil Observations:

Major Rooting Zone: 3" in.

Cryoturbated? Y ☒ N

Thixotropic? Y ☒ N

Hydric Soils?

☒ Y ☐ N

Wetland Determination

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☒ Yes ☐ No

Hydric Soils Present? ☒ Yes ☐ No

Plot Meets Wetland Criteria? ☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh #	70	Soil	
(4 veg photos in each direction, if different;	71	Soil	
2 soil photos: soil	72	E	
Profile and above pit)	74	S	
	75	W	



Plot Number: HDR5008_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR5008_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR5008_17 Description: Soil Date: 8/15/2017



Plot Number: HDR5008_17 Description: Soil Date: 8/15/2017

Archer Lat: N 59. 34066 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5013-17Archer Long: W 154. 25604Wetland? ☒ Y-T ☐ N ☐ N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halstead 2) Dalzell 3) _____
 Bear Guard: Gust Observer: _____
 Do 'Normal Circumstances' Exist? ☒ YES ☐ NO
 Is the Site Significantly Disturbed (Atypical Situation)? ☐ YES ☒ NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? ☐ YES ☒ NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/15/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: _____ map date: _____
 Township: 10S Range: 30W
 Section: 1 S.M. Quad No.: ILI-B-4
 General Location (opt): _____
 Site marked on map? ☒ Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Vac uli</u>	<u>S</u>	<u>FAC</u>	<u>15</u>			13. <u>Spirea ste.</u>	<u>S</u>	<u>FACU</u>	<u>5</u>		
2. <u>Emp nig</u>	<u>S</u>	<u>FAC</u>	<u>30</u>			14. <u>Angelica luc</u>	<u>H</u>	<u>FACU</u>	<u>3</u>		
3. <u>Aln vit</u>	<u>S</u>	<u>FAC</u>	<u>20</u>			15. <u>Samb la Cam</u>	<u>H</u>	<u>FACW</u>	<u>T</u>		
4. <u>Fem orn</u>	<u>H</u>	<u>FAC</u>	<u>5</u>			16. <u>Gemma eri</u>	<u>H</u>	<u>FACU</u>	<u>T</u>		
5. <u>Cal can</u>	<u>H</u>	<u>FAC</u>	<u>20</u>			17. <u>Sedum ros (Rhoiz)</u>	<u>S</u>	<u>FAC</u>	<u>T</u>		
6. <u>Cor sue</u>	<u>H</u>	<u>FAC</u>	<u>T</u>			18. <u>Car big</u>	<u>H</u>	<u>FAC</u>	<u>20</u>		
7. <u>Bot nan</u>	<u>S</u>	<u>FAC</u>	<u>10</u>			19. <u>Car mern</u>	<u>H</u>	<u>FACW</u>	<u>5</u>		
8. <u>Cha ang</u>	<u>H</u>	<u>FACU</u>	<u>17</u>			20.					
9. <u>Eri gen per</u>	<u>H</u>	<u>FACW</u>	<u>3</u>			21.					
10. <u>Rub cha</u>	<u>S</u>	<u>FACW</u>	<u>3</u>			22. lichen					
11. <u>Er ang</u>	<u>H</u>	<u>OBL</u>	<u>5</u>			23. moss (feather / sphagnum)					
12. <u>Sal ric?</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by: _____
 OBL species 5 X1= 5
 FACW species 11 X2= 22
 FAC species 125 X3= 375
 FACU species 15 X4= 60
 UPL + NL species 0 X5= 0
 Column Totals: 156 (A) 402 (B)
 Prevalence Index = B/A= 2.96

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: ODBESB
 JDWet Code: W
 ENWI Code: PSS1/EM1B
 Hydrophytic Vegetation Indicators
☒ Dominance Test is >50%
☒ Prevalence Index is ≤3.0
☒ Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

☒ Y ☐ N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S=88/44/17.6 H=68/34/13.6

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? ☒ Y ☐ N
 Depth of Surface Water: 1 " in low spots
 Water Table Present? ☒ Y ☐ N
 Depth to Water Table: 60 "
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y ☒ N
 If Y, depth to Layer _____"
 Restrictive Layer Type _____"
 If lateral flow, at what depth? _____"
 Saturated Soil Present? ☒ Y ☐ N
 Depth to saturation 2 "
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 4 (total)

☒ Surface Water (A1)
☒ High Water Table (A2)
☒ Saturation (A3)
☒ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Marl Deposits (B15)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☒ Hydrogen Sulfide Odor (C1)
☒ Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
 Other (explain in Hydrology Comments)

Secondary Indicators 2 (total)

☒ Water-Stained Leaves (B9)
☒ Drainage Patterns (B10)
☒ Oxidized Rhizospheres on Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3) (≠ frost)
☐ Micro-topographic Relief (D4)
☒ FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: S (cardinal) Slope: 10 % Local relief: concave / convex / none
 HGM Class: slope Landform: foot slope Macrotopo (in poly): Slightly in top Microtopo: Hummocks
 Are climatic/hydrologic conditions at the site typical for this time of year? ☒ Y ☐ N Unknown (Explain if N or Unknown)

Wetland Hydrology?

☒ Y ☐ N

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: _____ Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-4	Oi												
4-6	Oe												
6-9	C	2.5Y 6/2	100	VF SL									Ash
9-20	Oab												H2S

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4) @ 9"
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
☒ Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α,α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

Other Soil Observations:

Major Rooting Zone: 0-6 in.

Cryoturbated? Y ☒ N

Thixotropic? Y ☒ N

Hydric Soils?

☒ Y ☐ N

Wetland Determination

- Hydrophytic Vegetation Present? ☒ Yes ☐ No
 Wetland Hydrology Present? ☒ Yes ☐ No
 Hydric Soils Present? ☒ Yes ☐ No
 Plot Meets Wetland Criteria? ☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh #	90	Soil	
(4 veg photos in each direction, if different;	91	Soil	
2 soil photos: soil	92	N	
Profile and above pit)	93	E	
	94	S	
	95	N	



Plot Number: HDR5013_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR5013_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR5013_17 Description: Soil Date: 8/15/2017



Plot Number: HDR5013_17 Description: Soil Date: 8/15/2017

Archer Lat: N 59. 34072 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5074-17Archer Long: W 154. 25052Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halskard 2) Dalzell 3) _____
 Bear Guard: Gust Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/15/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: _____ map date: _____
 Township: 10S Range: 30W
 Section: 1 S.M. Quad No.: ILT-B-4
 General Location (opt): _____
 Site marked on map? 30

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Aln. vir.</u>	<u>S</u>	<u>FAC</u>	<u>75</u>	<u><5</u>	<u><3</u>	13.					
2. <u>Sal. ber.</u>	<u>S</u>	<u>FAC</u>	<u>10</u>			14.					
3. <u>Spi. bea. (Spi. Ste.)</u>	<u>S</u>	<u>FACU</u>	<u>5</u>			15.					
4. <u>Ang. luc.</u>	<u>H</u>	<u>FACU</u>	<u>10</u>			16.					
5. <u>Ach. fel.</u>	<u>H</u>	<u>FAC</u>	<u>5</u>			17.					
6. <u>Cor. sue.</u>	<u>H</u>	<u>FAC</u>	<u>5</u>			18.					
7. <u>Rub. ped.</u>	<u>H</u>	<u>FAC</u>	<u>T</u>			19.					
8. <u>Emp. nig.</u>	<u>S</u>	<u>FAC</u>	<u>T</u>			20.					
9. <u>Cal. can.</u>	<u>H</u>	<u>FAC</u>	<u>5</u>			21.					
10. <u>Cha. ang.</u>	<u>H</u>	<u>FACU</u>	<u>5</u>			22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by:

OBL species 0 X1= 0
 FACW species 0 X2= 0
 FAC species 100 X3= 300
 FACU species 20 X4= 80
 UPL + NL species 0 X5= 0
 Column Totals: 120 (A) 380 (B)
 Prevalence Index = B/A = 3.17

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 6 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 66.6 (A/B)

Project Veg Type: CAZS
 JDWet Code: 2
 ENWI Code: 2
 Hydrophytic Vegetation Indicators
Y Dominance Test is >50%
N Prevalence Index is ≤3.0
- Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
Y N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S=90/45/18 H=30/15/6

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N
 Depth of Surface Water: _____
 Water Table Present? Y N
 Depth to Water Table: _____
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y N
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y N
 Depth to saturation _____
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
N High Water Table (A2)
N Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: S (cardinal) Slope: 10 %Local relief: concave / convex noneHGM Class: N/A Landform: Hillside Macrotopo (in poly): Undulate Microtopo: Hum - large Boulders

Wetland Hydrology?

Are climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)Y N

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-4	O _i												
4-7	C	10YR 6/2	95	FsAL	C	10YR 5/4	5	RC		F _i			A ₃ L
7-10	A	10YR 3/2	100	SIL									
10-20	B	10YR 3/4	100	SAL									

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

Other Soil Observations:

Major Rooting Zone: 7 in.

Cryoturbated? Y ☒ N

Thixotropic? Y ☒ N

Hydric Soils?

Y ☒ N

Wetland Determination

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☐ Yes ☒ No

Hydric Soils Present? ☐ Yes ☒ No

Plot Meets Wetland Criteria? Yes Yes-Transitional ☒ No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh #	96	Soil	
(4 veg photos in each direction, if different;	97	Soil	
2 soil photos: soil	98	N	
Profile and above pit)	99	F	
	100	S	
	101	W	



Plot Number: HDR5014_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR5014_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR5014_17 Description: Soil Date: 8/15/2017



Plot Number: HDR5014_17 Description: Soil Date: 8/15/2017

Archer Lat: N 59. 34114 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5015-17Archer Long: W 154. 25670Wetland? (Y) Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halstead 2) Dalzell 3) _____
 Bear Guard: GUST Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/15/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: _____ map date: _____
 Township: 10S Range: 30W
 Section: 1 S.M. Quad No.: ILI B-4
 General Location (opt): _____
 Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Vac oli</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			13. <u>Gormium eri.</u>	<u>H</u>	<u>FACU</u>	<u>T</u>		
2. <u>Rub cha</u>	<u>H</u>	<u>FACW</u>	<u>5</u>			14. <u>Cor sue</u>	<u>H</u>	<u>FAC</u>	<u>T</u>		
3. <u>Cal can</u>	<u>H</u>	<u>FAC</u>	<u>10</u>			15. <u>Sedum ros (Rho.int.)</u>	<u>H</u>	<u>FAC</u>	<u>T</u>		
4. <u>Emp nig</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			16. <u>Cor aqu</u>	<u>H</u>	<u>OBL</u>	<u>10</u>		
5. <u>Er ang</u>	<u>H</u>	<u>OBL</u>	<u>25</u>			17. <u>Tri ces</u>	<u>H</u>	<u>OBL</u>	<u>25</u>		
6. <u>Bet num</u>	<u>S</u>	<u>FAC</u>	<u>3</u>			18. <u>And pol</u>	<u>S</u>	<u>FACW</u>	<u>T</u>		
7. <u>Carex ros</u>	<u>H</u>	<u>OBL</u>	<u>10</u>			19.					
8. <u>Carex rotund</u>	<u>H</u>	<u>OBL</u>	<u>30</u>			20.					
9. <u>Eriophor per</u>	<u>H</u>	<u>FACW</u>	<u>1</u>			21.					
10. <u>Ain Vix</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			22. lichen					
11. <u>Salix pul</u>	<u>S</u>	<u>FAC</u>	<u>3</u>			23. moss (feather / sphagnum)					
12. <u>Ir is set</u>	<u>H</u>	<u>FAC</u>	<u>7</u>			24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by: _____
 OBL species 105 X1= 105
 FACW species 5 X2= 10
 FAC species 31 X3= 93
 FACU species 0 X4= 0
 UPL + NL species 0 X5= 0
 Column Totals: 136 (A) 203 (B)
 Prevalence Index = B/A= 1.49

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 6 (A)
 Total Number of Dominant Species Across All Strata: 6 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: SSMWM
 JDWet Code: W
 ENWI Code: PEMI/SSIC?
 Hydrophytic Vegetation Indicators
 Y Dominance Test is >50%
 Y Prevalence Index is ≤3.0
 Y Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

(Y) N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S=21/10.5/4.2 H=115/57.5/23

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? (Y) N
 Depth of Surface Water: 1-2" in low areas
 Water Table Present? (Y) N
 Depth to Water Table: 6"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? (Y) N
 Depth to saturation 4"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 4 (total)

Y Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
Y Sediment Deposits (B2)
Y Drift Deposits (B3)
Y Algal Mat or Crust (B4)
Y Marl Deposits (B15)
Y Iron Deposits (B5)
Y Surface Soil Cracks (B6)
Y Inundation Visible on Aerial Imagery (B7)
Y Sparsely Vegetated Concave Surface (B8)
Y Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 5 (total)

N Water-Stained Leaves (B9)
Y Drainage Patterns (B10)
Y Oxidized Rhizospheres on Living Roots (C3)
Y Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
Y Geomorphic Position (D2)
Y Shallow Aquitard (D3) (≠ frost)
Y Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: S (cardinal) Slope: 3 %HGM Class: slope Landform: foot slopeLocal relief: concave / convex/ noneMacrotopo (in poly): slightly concave Microtopo: Hummocky (small)

Wetland Hydrology?

Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)(Y) N

Soils

PLOT NO: HDR 5015-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: PD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-3	Oe												
3-6	C	10YR 6/2	90	FSL	C	10YR 5/6	10	MRC		F		Y	As h
6-9	Deb												
9-18	Ab	7.5YR 3/2	100	SIL								Y	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

☒ Histosol or Histel (A1)

☒ Histic Epipedon (A2)

☒ Hydrogen Sulfide (A4) *eb"*

☒ Thick Dark Surface (A12)

☐ Alaska Gleyed (A13)

☐ Alaska Redox (A14)

☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

☒ Alaska Color Change (TA4)

☐ Alaska Alpine Swales (TA5)

☐ Alaska Redox with 2.5Y Hue (4a3)

☐ Alaska Gleyed w/out Hue 5Y or Redder Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

☒ Soils with Low Organic Carbon Content (4b1)

☐ Soils with Low Weatherable Iron Content (4b2)

☐ Soil pH Greater than 7.2 (4b3)

☐ Recently Developed Wetland (4b4)

☒ Positive α,α Test (60% of 4" layer) (4c)

☐ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

Other Soil Observations:

Major Rooting Zone: 7 in.

Cryoturbated? Y ☒

Thixotropic? Y ☒

Hydric Soils?

☒ Y ☐ N

Wetland Determination

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☒ Yes ☐ No

Hydric Soils Present? ☒ Yes ☐ No

Plot Meets Wetland Criteria? ☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh #	102	Soil	
(4 veg photos in each direction, if different;	103	Soil	
2 soil photos: soil	104	N	
Profile and above pit)	105	E	
	106	S	
	107	W	



Plot Number: HDR5015_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR5015_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR5015_17 Description: Soil Date: 8/15/2017



Plot Number: HDR5015_17 Description: Soil Date: 8/15/2017

Archer Lat: N 59. 33614 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5017-17Archer Long: W 154. 41435Wetland? ☒ Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership

Investigator: 1) Halstead 2) Dalzell 3) _____Bear Guard: GUST Observer: _____Do 'Normal Circumstances' Exist? ☒ YES ☐ NOIs the Site Significantly Disturbed (Atypical Situation)? ☒ YES ☐ NO

(Indicators altered due to human acts or natural events)

Is the Area a Potential Problem Area? ☒ YES ☐ NO

(Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/16/2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska

Subregion: Western/Interior

Field Map: _____ map date: _____

Township: 10 S Range: 31 WSection: 1 S.M. Quad No.: ILL B-4

General Location (opt): _____

Site marked on map? Y

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Cnl can</u>	H	FAC	20			13. <u>Cha ang</u>	H	FACW	T		
2. <u>Ger eri</u>	H	FACW	5			14. <u>Sal pul</u>	S	FAC	3		
3. <u>Sed ro S (Rho.int.)</u>	H	FAC	5			15. <u>Car big</u>	H	FAC	10		
4. <u>Vac uli</u>	S	FAC	10			16. <u>Egw ang</u>	H	FAC	T		
5. <u>Emp nig</u>	S	FAC	5			17. <u>Car aqu</u>	H	OBL	30		
6. <u>Sag ang</u>	H	FAC	5			18. <u>Eri per</u>	H	FACW	T		
7. <u>Potipala (Com.pal.)</u>	H	OBL	5			19. <u>Angelica luc</u>	H	FACW	T		
8. <u>Bet num</u>	S	FAC	3			20.					
9. <u>Rub cha</u>	H	FACW	5			21.					
10. <u>Iris set</u>	H	FAC	T			22. lichen					
11. <u>Ti. as</u>	H	OBL	25			23. moss (feather / sphagnum)			60		
12. <u>Vid lan.</u>	H	FACW	3			24. bare ground					

Prevalence Index worksheet:

Total % Cover of

Multiply by:

OBL species 60 X1= 60
 FACW species 8 X2= 16
 FAC species 61 X3= 183
 FACU species 5 X4= 20
 UPL + NL species 0 X5= 0
 Column Totals: 134 (A) 279 (B)
 Prevalence Index = B/A= 2.08

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: SSMWMJDWet Code: WENWI Code: PEMIB

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%☒ Prevalence Index is ≤3.0☒ Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

☒ Y ☐ N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S=21/10.5/4.2

H=113/56.5/22.6

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? ☒ Y ☐ N

Depth of Surface Water: _____

Water Table Present? ☒ Y ☐ NDepth to Water Table: 4 "Just seeping in at this level, not yet filled to this level? (check if yes) ☐Restrictive Layer w/in 24"? ☐ Y ☒ N

If Y, depth to Layer _____

Restrictive Layer Type _____

If lateral flow, at what depth? _____

Saturated Soil Present? ☒ Y ☐ NDepth to saturation 2 "

Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 3 (total)☒ Surface Water (A1)☒ High Water Table (A2)☒ Saturation (A3)☒ Water Marks (B1)☐ Sediment Deposits (B2)☐ Drift Deposits (B3)☐ Algal Mat or Crust (B4)☐ Marl Deposits (B15)☐ Iron Deposits (B5)☐ Surface Soil Cracks (B6)☐ Inundation Visible on Aerial Imagery (B7)☐ Sparsely Vegetated Concave Surface (B8)☒ Hydrogen Sulfide Odor (C1)☒ Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)☐ Other (explain in Hydrology Comments)Secondary Indicators 3 (total)☒ Water-Stained Leaves (B9)☒ Drainage Patterns (B10)☒ Oxidized Rhizospheres on Living

Roots (C3)

☐ Presence of Reduced Iron (C4)☒ Salt Deposits (C5)☒ Stunted or Stressed Plants (D1)☒ Geomorphic Position (D2)☒ Shallow Aquitard (D3) (≠ frost)☒ Micro-topographic Relief (D4)☒ FAC-Neutral Test (D5)

Hydrology Comments:

plot ~ 15' away from a stream channel

Aspect: SE (cardinal) Slope: 3 %Local relief: concave / convex / noneHGM Class: slope Landform: Gully Macrotopo (in poly): concave Microtopo: flatAre climatic/hydrologic conditions at the site typical for this time of year? ☒ Y ☐ N Unknown (Explain if N or Unknown)

Wetland Hydrology?

☒ Y ☐ N

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: PD

Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-4	Oi												
4-8	C	2.5Y 6/2	85	FsAL	C	10YR 5/6	15	M, RC		m			Ash
8-20	Oe												H ₂ S @ 8"

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4) @ 8"
☒ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☐ Alaska Color Change (TA4)
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox with 2.5Y Hue (4a3)
☐ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:**Other Soil Observations:**

Major Rooting Zone: 0-8 in.

Cryoturbated? Y (N)

Thixotropic? Y (N)

Hydric Soils?

Y N

Wetland Determination

Hydrophytic Vegetation Present?

Yes No

Wetland Hydrology Present?

Yes No

Hydric Soils Present?

Yes No

Plot Meets Wetland Criteria?

Yes Yes-Transitional No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh #	112	SOIL	
(4 veg photos in each direction, if different;	113		
2 soil photos: soil	114	N	
Profile and above pit)	115	E	
	116	S	
	117	W	



Plot Number: HDR5017_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5017_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5017_17 Description: Soil Date: 8/16/2017



Plot Number: HDR5017_17 Description: Soil Date: 8/16/2017

Archer Lat: N 59. 33607 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5019-17Archer Long: W 154. 41449Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Holstead 2) Dalzell 3) _____
 Bear Guard: Gust Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/16/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 25 map date: _____
 Township: 10 S Range: 31 W
 Section: 1 S.M. Quad No.: ILZ B-4
 General Location (opt): _____
 Site marked on map? X

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Aln. vir.</u>	<u>S</u>	<u>FAC</u>	<u>75</u>	<u>6'</u>	<u><3</u>	13.					
2. <u>Rub. spe.</u>	<u>S</u>	<u>FACW</u>	<u>10</u>			14.					
3. <u>Spi. bla. (Spi. bla.)</u>	<u>S</u>	<u>FACW</u>	<u>5</u>			15.					
4. <u>Dry. exp.</u>	<u>H</u>	<u>FACW</u>	<u>10</u>			16.					
5. <u>Ver. vir.</u>	<u>H</u>	<u>FAC</u>	<u>5</u>			17.					
6. <u>Vac. ala.</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			18.					
7. <u>Car. sue.</u>	<u>H</u>	<u>FAC</u>	<u>T</u>			19.					
8. <u>Gym. dri.</u>	<u>H</u>	<u>FACW</u>	<u>5</u>			20.					
9. <u>Lyc. ann. (Spi. ann.)</u>	<u>H</u>	<u>FACW</u>	<u>5</u>			21.					
10. <u>Th. phe. (Phe. con.)</u>	<u>H</u>	<u>FACW</u>	<u>5</u>			22. lichen			<u>0</u>		
11.						23. moss (feather / sphagnum)			<u>0</u>		
12.						24. bare ground			<u>0</u>		

Prevalence Index worksheet:

Total % Cover of _____ Multiply by: _____
 OBL species 0 X1= 0
 FACW species 0 X2= 0
 FAC species 95 X3= 255
 FACU species 40 X4= 160
 UPL + NL species 0 X5= 0
 Column Totals: 125 (A) 415 (B)
 Prevalence Index = B/A = 3.32

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 6 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 33.3 (A/B)

Project Veg Type: CATSJDWet Code: 25ENWI Code: 25

Hydrophytic Vegetation Indicators

N Dominance Test is >50%N Prevalence Index is ≤3.0- Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y (N)¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S=95/475/19 H=30/15/6

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y (N)
 Depth of Surface Water: _____
 Water Table Present? Y (N)
 Depth to Water Table: _____
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y (N)
 Depth to saturation _____
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
N High Water Table (A2)
N Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: E (cardinal) Slope: 15 % Local relief: concave / convex / none
 HGM Class: N/A Landform: Hillside Macrotopo (in poly): Flat Microtopo: Flat
 Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y (N)

PLOT NO: HDR 5019-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Indicators for Problematic Hydric Soils³

Other Hydric Soil Situations (see pg 88-91)³

Indicators for Problematic Hydric Soils		Other Hydric Soil Situations (see pg 88-91) ³	
<input checked="" type="checkbox"/> Histosol or Histel (A1)	<input checked="" type="checkbox"/> Alaska Color Change (TA4)	<input checked="" type="checkbox"/> Soils with Low Organic Carbon Content (4b1)	
<input checked="" type="checkbox"/> Histic Epipedon (A2)	<input checked="" type="checkbox"/> Alaska Alpine Swales (TA5)	<input checked="" type="checkbox"/> Soils with Low Weatherable Iron Content (4b2)	
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input checked="" type="checkbox"/> Alaska Redox with 2.5Y Hue (4a3)	<input checked="" type="checkbox"/> Soil pH Greater than 7.2 (4b3)	
<input checked="" type="checkbox"/> Thick Dark Surface (A12)	<input checked="" type="checkbox"/> Alaska Gleyed w/out Hue 5Y or Redder	<input checked="" type="checkbox"/> Recently Developed Wetland (4b4)	
<input checked="" type="checkbox"/> Alaska Gleyed (A13)	<input type="checkbox"/> Underlying layer (4a4)	<input checked="" type="checkbox"/> Positive α_a Test (60% of 4" layer) (4c)	
<input checked="" type="checkbox"/> Alaska Redox (A14)		<input checked="" type="checkbox"/> Soil determined to be ponded, flooded, H ₂ O Table @ $\leq 12"$	
<input checked="" type="checkbox"/> Alaska Gleyed Pores (A15)		<input checked="" type="checkbox"/> from surface for ≥ 14 consecutive days during growing season (4d)	

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Soil Comments: Profile dry throughout.

Other Soil Observations:

Major Rooting Zone: 12 in.

Cryoturbated? Y N

Thixotropic? ☒ Y ☐ N

Hydric Soils?

Y N

Wetland Determination

Hydrophytic Vegetation Present?	Yes	No		
Wetland Hydrology Present?	Yes	No		
Hydric Soils Present?	Yes	No		
Plot Meets Wetland Criteria?	Yes	Yes-Transitional	No	No-Transitional

Remarks:

Archer # _____	Photo # _____	Subject _____	Bearing _____
Ricoh # _____	<u>121</u>	<u>Soil</u>	_____
(4 veg photos in each	<u>122</u>	<u>Soil</u>	_____
direction, if different;	<u>123</u>	<u>N</u>	_____
2 soil photos: soil	<u>124</u>	<u>E</u>	_____
Profile and above pit)	<u>125</u>	<u>S</u>	_____
	<u>126</u>	<u>N</u>	_____



Plot Number: HDR5019_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5019_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5019_17 Description: Soil Date: 8/16/2017



Plot Number: HDR5019_17 Description: Soil Date: 8/16/2017

Archer Lat: N 59. 32707 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5025-17Archer Long: W 154. 46500Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halstead 2) Dalzell 3) _____
 Bear Guard: Gust Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/16/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 24 map date: _____
 Township: 10 S Range: 31 W
 Section: 11 S.M. Quad No.: DLI B-4
 General Location (opt): _____
 Site marked on map? X

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Emp. nig.</u>	<u>S</u>	<u>FAC</u>	<u>25</u>	<u><8"</u>		13.					
2. <u>Arc. alp.</u>	<u>S</u>	<u>FACW</u>	<u>5</u>			14.					
3. <u>Rho. tom.</u>	<u>S</u>	<u>FAC</u>	<u>10</u>			15.					
4. <u>Vac. uli.</u>	<u>S</u>	<u>FAC</u>	<u>10</u>			16.					
5. <u>Lag. glab.</u>	<u>H</u>	<u>NL</u>	<u>T</u>			17.					
6. <u>Car. big.</u>	<u>H</u>	<u>FAC</u>	<u>10</u>			18.					
7. <u>Sal. arc.</u>	<u>S</u>	<u>FACU</u>	<u>5</u>			19.					
8. <u>Bot. ran.</u>	<u>S</u>	<u>FAC</u>	<u>T</u>			20.					
9. <u>Cam. las.</u>	<u>H</u>	<u>UPL</u>	<u>T</u>			21.					
10. <u>Dia. lap.</u>	<u>S</u>	<u>NL</u>	<u>T</u>			22. lichen	<u>2</u>		<u>60</u>		
11. <u>Hic. alp.</u>	<u>H</u>	<u>NL</u>	<u>T</u>			23. moss/feather / sphagnum			<u>10</u>		
12. <u>Arct. alp.</u>	<u>H</u>	<u>NL</u>	<u>T</u>			24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by: _____
 OBL species 0 X1= 0
 FACW species 5 X2= 10
 FAC species 55 X3= 165
 FACU species 5 X4= 20
 UPL + NL species T X5= 0
 Column Totals: 65 (A) 195 (B)
 Prevalence Index = B/A = 3.00

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: DEST-L
 JDWet Code: 2
 ENWI Code: 2
 Hydrophytic Vegetation Indicators
 X Dominance Test is >50%
 X Prevalence Index is ≤3.0
 X Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

(Y) N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Flat hilltop w/ some exposed rock.
 S=55/27.5/11 H=10/5/2

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y (N)
 Depth of Surface Water: _____
 Water Table Present? Y (N)
 Depth to Water Table: _____
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y (N)
 Depth to saturation _____
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
N High Water Table (A2)
N Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments: No hydro indicators.Aspect: N/A (cardinal) Slope: 0 %

Local relief: concave / convex/ none

HGM Class: N/A Landform: Hilltop Macrotopo (in poly): Flat Microtopo: Hum smallAre climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

(Y) (N)

Soils

PLOT NO: HDR 5025-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-5	O _i	-	-	-	-	-	-	-	-	-	-	-	
5-6	C	2.5Y 6/2	90	FSALD	-	10YR 5/4	10	-	-	h	-	-	
6-9	A _{b1}	7.5YR 3/2	100	SALD	-	-	-	-	-	-	-	-	
9-11	A _{b2}	7.5YR 2.5/3	100	SALD	-	-	-	-	-	-	-	-	
11-19	A _{b3}	7.5YR 2.5/2	100	SALD	-	-	-	-	-	-	-	N	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ Histosol or Histel (A1)
- ☒ Histic Epipedon (A2)
- ☒ Hydrogen Sulfide (A4)
- ☒ Thick Dark Surface (A12)
- ☒ Alaska Gleyed (A13)
- ☒ Alaska Redox (A14)
- ☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
- ☒ Alaska Alpine Swales (TA5)
- ☒ Alaska Redox with 2.5Y Hue (4a3)
- ☒ Alaska Gleyed w/out Hue 5Y or Redder Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
- ☒ Soils with Low Weatherable Iron Content (4b2)
- ☒ Soil pH Greater than 7.2 (4b3)
- ☒ Recently Developed Wetland (4b4)
- ☒ Positive α,α Test (60% of 4" layer) (4c)
- ☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: moist profile @ 17" but not saturated.

Other Soil Observations:

Major Rooting Zone: 8 in.

Cryoturbated? Y ☒ N

Thixotropic? Y ☒ N

Hydric Soils?

Y ☒ N

Wetland Determination

Hydrophytic Vegetation Present?

Yes ☒ No

Wetland Hydrology Present?

Yes ☒ No

Hydric Soils Present?

Yes ☒ No

Plot Meets Wetland Criteria?

Yes Yes-Transitional ☒ No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh #	149	Soil	
(4 veg photos in each direction, if different;	150	↓	
2 soil photos: soil	151	N	
Profile and above pit)	52	E	
	53	S	
	54	W	



Plot Number: HDR5025_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5025_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5025_17 Description: Soil Date: 8/16/2017



Plot Number: HDR5025_17 Description: Soil Date: 8/16/2017

Archer Lat: N 59. 32689 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5030-17Archer Long: W 154. 46642Wetland? ☒ Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Hulstead 2) Dalzell 3) _____
 Bear Guard: Gust Observer: _____
 Do 'Normal Circumstances' Exist? YES ☒ NO ☐
 Is the Site Significantly Disturbed (Atypical Situation)? YES ☐ NO ☒
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES ☐ NO ☒
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/16/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 24 map date: _____
 Township: 10 S Range: 31 W
 Section: 11 S.M. Quad No.: III B-4
 General Location (opt): _____
 Site marked on map? Y

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Calcan</u>	H	FAC	25			13. <u>Angelica linc</u>	H	FAC	T		
2. <u>Rub cha</u>	H	FACW	20			14. <u>pebble</u>					
3. <u>Sol an</u>	S	FAC	20	<8"		15.					
4. <u>Sed n2S (Rho.int)</u>	H	FAC	5			16.					
5. <u>Emp n2S</u>	S	FAC	5			17.					
6. <u>Vac uls</u>	S	FAC	15	<8"		18.					
7. <u>Cor big</u>	H	FAC	30			19.					
8. <u>Roa ora</u>	H	FACU	5			20.					
9. <u>Tri. cor</u>	H	FACU	T			21.					
10. <u>Sar. can.</u>	H	FACW	5			22. lichen					
11. <u>Hydr. scr</u>	H	FAC	10			23. moss (feather / sphagnum)					
12. <u>Emp. per</u>	H	FACW	5			24. bare ground					

Prevalence Index worksheet:

Total % Cover of

Multiply by:

OBL species 0 X1= 0
 FACW species 30 X2= 100
 FAC species 110 X3= 330
 FACU species 5 X4= 20
 UPL + NL species 0 X5= 0
 Column Totals: 145 (A) 410 (B)
 Prevalence Index = B/A = 2.83

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: OMIST
 JDWet Code: W
 ENWI Code: PEM/SS#c
 Hydrophytic Vegetation Indicators
 Dominance Test is >50%
 Prevalence Index is ≤3.0
 Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
☒ Y ☐ N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S=40/20/8

H=105/52.5/11

Shrubs are <8" but this veg code is best fit due to lack of ericaceous shrubs.

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y ☒ N ☐
 Depth of Surface Water: _____
 Water Table Present? Y ☒ N ☐
 Depth to Water Table: 2"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y ☒ N ☐
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y ☒ N ☐
 Depth to saturation 0" surface
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 2 (total)

N Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
 Sediment Deposits (B2)
 Drift Deposits (B3)
 Algal Mat or Crust (B4)
 Marl Deposits (B5)
 Iron Deposits (B5)
 Surface Soil Cracks (B6)
 Inundation Visible on Aerial Imagery (B7)
 Sparsely Vegetated Concave Surface (B8)
 Hydrogen Sulfide Odor (C1)
 Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
 Other (explain in Hydrology Comments)

Secondary Indicators 3 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
Y Oxidized Rhizopheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
Y Geomorphic Position (D2)
N Shallow Aquitard (D3) (# frost)
N Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

no stream channel

Aspect: NE (cardinal) Slope: 3 %Local relief: concave / convex / noneHGM Class: Slope Landform: GulchMacrotopo (in poly): concave Microtopo: Flat

Wetland Hydrology?

Are climatic/hydrologic conditions at the site typical for this time of year? ☒ Y ☐ N Unknown (Explain if N or Unknown)
☒ Y ☐ N

Soils

PLOT NO: HDR 5030-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: SPD

Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-2	Oe												
2-7	C	2.5Y6/2	85	VFSAL	C	7.5YR4/4	15	M, RC		M			
7-8	Oeb												
8-12	Ab	2.5Y4/1	90	FSAL	C	7.5YR4/4	10	M, RC		F		Y	
12-18	C	2.5Y6/2	70	VFSAL	C	7.5YR5/6	30	M, RC		C		Y	Ash

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematicOther Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α,α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

Positive αα below 8"

Other Soil Observations:

Major Rooting Zone: 10 in.

Cryoturbated? Y N

Thixotropic? Y N

Hydric Soils?

Y N

Wetland Determination

Hydrophytic Vegetation Present?

Yes No

Wetland Hydrology Present?

Yes No

Hydric Soils Present?

Yes No

Plot Meets Wetland Criteria?

Yes Yes-Transitional No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh #	175	SOIL	
(4 veg photos in each direction, if different;	176		
2 soil photos: soil	177	N	
Profile and above pit)	178	E	
	179	S	
	180	W	



Plot Number: HDR5030_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5030_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5030_17 Description: Soil Date: 8/16/2017



Plot Number: HDR5030_17 Description: Soil Date: 8/16/2017

Archer Lat: N 59. 34246 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5034-17Archer Long: W 154. 51138Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Hallstead 2) Dalzell 3) _____
 Bear Guard: Gust Observer: _____
 Do 'Normal Circumstances' Exist? (YES) NO
 Is the Site Significantly Disturbed (Atypical Situation)? (YES) NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? (YES) NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/16/2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska

Subregion: Western/Interior

Field Map: _____ map date: _____

Township: 10 S Range: 31 WSection: 4 S.M. Quad No.: 112 8-5

General Location (opt): _____

Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Aln. vir</u>	S	FAC	70	>5		13. <u>Lycopodium sel</u>	H	NL	T		
2. <u>Sal. pul</u>	S	FAC	20	>5		14.					
3. <u>Vac. ova</u>	S	FAC	10			15.					
4. <u>Rub. spe</u>	S	FACU	15			16.					
5. <u>Ang. luc</u>	H	FACU	5			17.					
6. <u>The. phe (Pheon)</u>	H	FACU	30			18.					
7. <u>Opl. hor</u>	S	FACU	10			19.					
8. <u>The. edr.</u>	H	FACU	5			20.					
9. <u>Var. vir</u>	H	FAC	5			21.					
10. <u>Can. cam</u>	H	FAC	5			22. lichen					
11. <u>Epi. bpa (spi. ste)</u>	S	FACU	5			23. moss (feather / sphagnum)			5		
12. <u>Mm. fer.</u>	S	FACU	5			24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by:

OBL species 0 X1= 0

FACW species 0 X2= 0

FAC species 112 X3= 336

FACU species 73 X4= 292

UPL + NL species 0 X5= 0

Column Totals: 185 (A) 628 (B)

Prevalence Index = B/A= 3.39

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That are OBL, FACW, or FAC: 50 (A/B)

Project Veg Type: CATS

JDWet Code: U

ENWI Code: U

Hydrophytic Vegetation Indicators

N Dominance Test is >50%

N Prevalence Index is ≤3.0

- Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y (N)¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S=135/67.5/27 H=50/25/10

Hydrology

Observations (Measured from grd surface):

Surface Water Present? Y (N)

Depth of Surface Water: _____

Water Table Present? Y (N)

Depth to Water Table: _____

Just seeping in at this level, not yet filled to this level? (check if yes) ☐

Restrictive Layer w/in 24"? Y (N)

If Y, depth to Layer _____

Restrictive Layer Type _____

If lateral flow, at what depth? _____

Saturated Soil Present? Y (N)

Depth to saturation _____

Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)

N High Water Table (A2)

N Saturation (A3)

N Water Marks (B1)

N Sediment Deposits (B2)

N Drift Deposits (B3)

N Algal Mat or Crust (B4)

N Marl Deposits (B15)

N Iron Deposits (B5)

N Surface Soil Cracks (B6)

N Inundation Visible on Aerial Imagery (B7)

N Sparsely Vegetated Concave Surface (B8)

N Hydrogen Sulfide Odor (C1)

N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)

N Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)

N Drainage Patterns (B10)

N Oxidized Rhizospheres on Living Roots (C3)

N Presence of Reduced Iron (C4)

N Salt Deposits (C5)

N Stunted or Stressed Plants (D1)

N Geomorphic Position (D2)

N Shallow Aquitard (D3) (≠ frost)

N Micro-topographic Relief (D4)

N FAC-Neutral Test (D5)

Hydrology Comments:

No hydro indicators

Aspect: S (cardinal) Slope: 1-2 %Local relief: concave / convex / noneHGM Class: MALandform: ToeslopeMacrotopo (in poly): concaveMicrotopo: Flat

Wetland Hydrology?

Y (N)Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

PLOT NO: HDR 5034-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: Well drained Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- N Histosol or Histel (A1)
- N Histic Epipedon (A2)
- N Hydrogen Sulfide (A4)
- N Thick Dark Surface (A12)
- N Alaska Gleyed (A13)
- N Alaska Redox (A14)
- N Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

N Alaska Color Change (TA4)
N Alaska Alpine Swales (TA5)
N Alaska Redox with 2.5Y Hue (4a3)
N Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- N Soils with Low Organic Carbon Content (4b1)
- N Soils with Low Weatherable Iron Content (4b2)
- N Soil pH Greater than 7.2 (4b3)
- N Recently Developed Wetland (4b4)
- N Positive α, α Test (60% of 4" layer) (4c)
- N Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

Other Soil Observations:

Major Rooting Zone: 0-10 in.

Cryoturbated? Y (N

Thixotropic? ☒ Y ☐ N

Hydric Soils?

Y N

Wetland Determination

Hydrophytic Vegetation Present?	Yes	No		
Wetland Hydrology Present?	Yes	No		
Hydric Soils Present?	Yes	No		
Plot Meets Wetland Criteria?	Yes	Yes-Transitional	No	No-Transitional

Remarks:

Archer # _____	Photo #	Subject	Bearing
Ricoh # _____	<u>192</u>	<u>SOIL</u>	_____
(4 veg photos in each	<u>193</u>	<u>SOIL</u>	_____
direction, if different;	<u>194</u>	<u>N</u>	_____
2 soil photos: soil	<u>195</u>	<u>E</u>	_____
Profile and above pit)	<u>196</u>	<u>S</u>	_____
	<u>197</u>	<u>W</u>	_____



Plot Number: HDR5034_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5034_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5034_17 Description: Soil Date: 8/16/2017



Plot Number: HDR5034_17 Description: Soil Date: 8/16/2017

Archer Lat: N 59. 34286 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5035-17Archer Long: W 154. 5140Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halstead 2) Dalzell 3) _____
 Bear Guard: Gust Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/16/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 22 map date: _____
 Township: 10 S Range: 31 W
 Section: 4 S.M. Quad No.: 212 B-5
 General Location (opt): _____
 Site marked on map? X

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Eri. ang.</u>	H	OBL	60			13. <u>Eri. ang.</u>	H	FAC	5		
2. <u>Eri. sch.</u>	H	OBL	5			14.					
3. <u>Sal. ret.</u>	S	FAC	17	<8"		15.					
4. <u>Sal. pol.</u>	S	FAC	10			16.					
5. <u>And. pol.</u>	S	FACW	T			17.					
6. <u>Sal. fus.</u>	S	FACW	5			18.					
7. <u>Car. agu.</u>	H	OBL	10			19.					
8. <u>Vac. uli.</u>	S	FAC	T			20.					
9. <u>Sau. angu.</u>	H	FAC	T			21.					
10. <u>Tri. pal.</u>	H	OBL	T			22. lichen					
11. <u>Pl. dil. (Pip. dil.)</u>	H	FACW	T			23. moss (feather / sphagnum)			60		
12. <u>Tri. coe.</u>	H	OBL	5			24. bare ground					

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species <u>80</u>	X1= <u>80</u>
FACW species <u>5</u>	X2= <u>10</u>
FAC species <u>22</u>	X3= <u>66</u>
FACU species <u>0</u>	X4= <u>0</u>
UPL + NL species <u>0</u>	X5= <u>0</u>
Column Totals: <u>107</u> (A)	<u>156</u> (B)
Prevalence Index = B/A=	<u>1.46</u>

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: SSMWM
 JDWet Code: W
 ENWI Code: BSIF
 Hydrophytic Vegetation Indicators
Y Dominance Test is >50%
Y Prevalence Index is ≤3.0
Y Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S=22/11/4.4H=85/42.5/17

Hydrology

Observations (Measured from gmd surface):

Surface Water Present? Y N
 Depth of Surface Water: 1-3"
 Water Table Present? Y N
 Depth to Water Table: 0-Surface
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y N
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y N
 Depth to saturation: 0-Surface
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 5 (total)

Y Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
Y Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 4 (total)

N Water-Stained Leaves (B9)
Y Drainage Patterns (B10)
Y Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
Y Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: N (cardinal) Slope: 2 % Local relief: concave / convex / none
 HGM Class: Slope Landform: Top slope Macrotopo (in poly): Flat Microtopo: Flat
 Are climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y N

PLOT NO: HDR 5035-17

Indicators of possible andic properties: smeary / low bulk density

Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

[illegible]





¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

Primary Indicators

- 2X Histosol or Histel (A1) - likely (redox)
2X Histic Epipedon (A2)
2X Hydrogen Sulfide (A4) e. 6"
2X Thick Dark Surface (A12)
2X Alaska Gleyed (A13)
2X Alaska Redox (A14)
2X Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

-  Alaska Color Change (TA4)
 Alaska Alpine Swales (TA5)
 Alaska Redox with 2.5Y Hue (4a3)
 Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- N Soils with Low Organic Carbon Content (4b1)
- N Soils with Low Weatherable Iron Content (4b2)
- N Soil pH Greater than 7.2 (4b3)
- N Recently Developed Wetland (4b4)
- N Positive α, α Test (60% of 4" layer) (4c)
- N Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: Refusal @ 13 on boulders

Other Soil Observations:

Major Rooting Zone: 8-10 in.

Cryoturbated? Y ☒ N

Thixotropic? Y ☒ N

Hydric Soils?

Y N

Wetland Determination

Hydrophytic Vegetation Present?

Yes No

Wetland Hydrology Present?

Yes No

Hydric Soils Present?

Yes No

Plot Meets Wetland Criteria?

Yes Yes-Transitional No No-Transitional

Remarks:

Archer # _____	Photo # _____	Subject _____	Bearing _____
Ricoh # _____	<u>198</u>	<u>Soil</u>	_____
(4 veg photos in each direction, if different;	<u>199</u>	<u>Soil</u>	_____
2 soil photos: soil	<u>200</u>	<u>N</u>	_____
Profile and above pit)	<u>201</u>	<u>E</u>	_____
	<u>202</u>	<u>S</u>	_____
	<u>203</u>	<u>W</u>	_____



Plot Number: HDR5035_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5035_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5035_17 Description: Soil Date: 8/16/2017



Plot Number: HDR5035_17 Description: Soil Date: 8/16/2017

Archer Lat: N 59. 3428.5 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5038-17Archer Long: W 154. 51389Wetland? ☒ Y-T ☐ N ☐ N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halstead 2) Dalzell 3) _____
 Bear Guard: Crust Observer: _____
 Do 'Normal Circumstances' Exist? ☒ YES ☐ NO
 Is the Site Significantly Disturbed (Atypical Situation)? ☒ YES ☐ NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? ☒ YES ☐ NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/16/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 22 map date: _____
 Township: 10 S Range: 31 W
 Section: 4 S.M. Quad No.: FLI B-5
 General Location (opt): _____
 Site marked on map? ☒ Y

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Ain vir</u>	S	FAC	70	6		13.					
2. <u>Sal sc</u>	S	FAC	30	6		14.					
3. <u>Cal can</u>	H	FAC	50			15.					
4. <u>Vipha lan</u>	H	FACW	5			16.					
5. <u>Smy can.</u>	H	FACW	5			17.					
6. <u>Opf hrr</u>	S	FACU	5			18.					
7. <u>Trie eur</u>	H	FACW	3			19.					
8. <u>Eg. pra</u>	H	FAC	5			20.					
9. <u>The. phe</u>	H	FACU	5			21.					
10. <u>Tal one</u>	H		5			22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of

Multiply by:

OBL species 0 X1= 0
 FACW species 10 X2= 20
 FAC species 150 X3= 450
 FACU species 13 X4= 52
 UPL + NL species 0 X5= 0
 Column Totals: 173 (A) 522 (B)
 Prevalence Index = B/A = 3.02

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: CAWTS
 JDWet Code: PSS/EMI B
 ENWI Code: 6W/EMI B
 Hydrophytic Vegetation Indicators
 Dominance Test is >50%
 Prevalence Index is ≤3.0
 Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

☒ Y ☐ N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S = 105/52.5/11 H = 68/34/13.6

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y ☒ N
 Depth of Surface Water: _____
 Water Table Present? ☒ Y ☐ N
 Depth to Water Table: 7 " weep
 Just seeping in at this level, not yet filled to this level? (check if yes) ☒
 Restrictive Layer w/in 24"? Y ☒ N
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? ☒ Y ☐ N
 Depth to saturation 4 "
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 2 (total)

☒ Surface Water (A1)
☒ High Water Table (A2)
☒ Saturation (A3)
☒ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Marl Deposits (B15)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Hydrogen Sulfide Odor (C1)
☐ Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
☐ Other (explain in Hydrology Comments)

Secondary Indicators 1 (total)

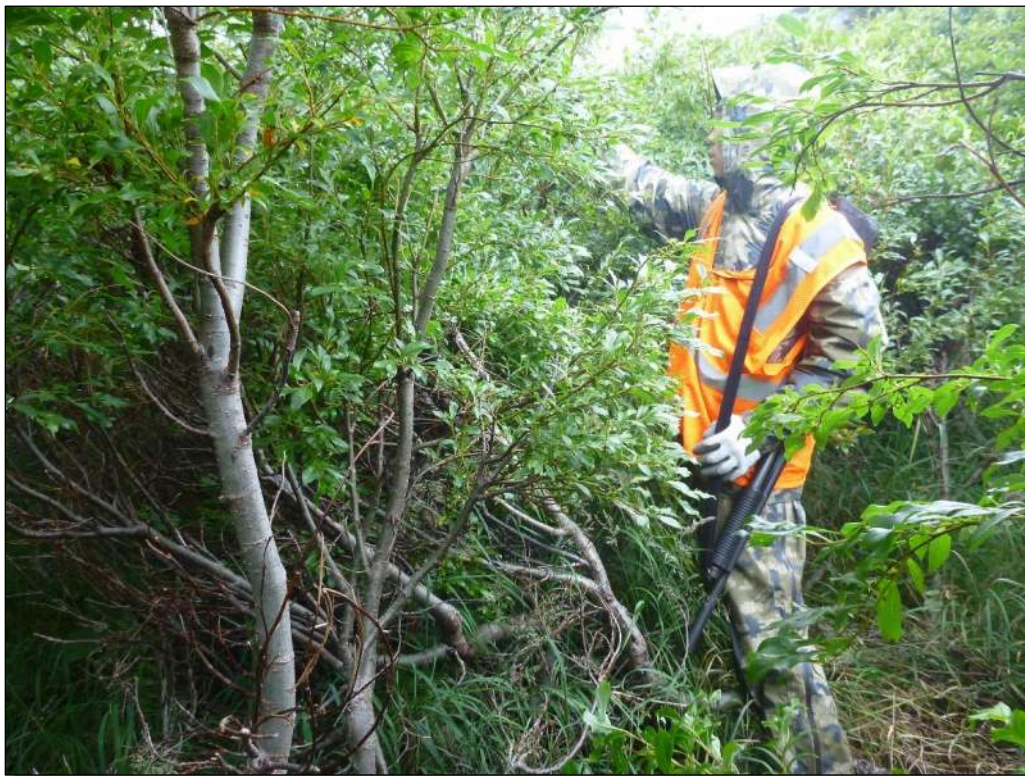
☒ Water-Stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospheres on Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☒ Geomorphic Position (D2)
☐ Shallow Aquitard (D3) (≠ frost)
☐ Micro-topographic Relief (D4)
☒ FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: NE (cardinal) Slope: 23% Local relief: concave / convex / none
 HGM Class: slope Landform: swale Macrotopo (in-poly): concave Microtopo: flat
 Are climatic/hydrologic conditions at the site typical for this time of year? ☒ Y ☐ N Unknown (Explain if N or Unknown)

Wetland Hydrology?

☒ Y ☐ N



Plot Number: HDR5038_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5038_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5038_17 Description: Soil Date: 8/16/2017



Plot Number: HDR5038_17 Description: Soil Date: 8/16/2017

Archer Lat: N 59. 34252 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5041-17Archer Long: W 154. 51666Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Holstead 2) Dalzell 3) _____
 Bear Guard: Guest Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/16/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 22 map date: _____
 Township: 10 S Range: 31 W
 Section: 4 S.M. Quad No.: III B-5
 General Location (opt): _____
 Site marked on map? No

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also <u>water, rock, snags</u>	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
① <u>Myr. gal.</u>	S	OBL	50			⑬ <u>Eri. ang.</u>	H	20	OBL		
2. <u>Emp. nig.</u>	S	FAC	10			⑭ <u>Car. adu.</u>	H	15	OBL		
3. <u>Vac. ulm.</u>	S	FAC	10			⑮ <u>Pot. pat.</u>	H	5	OBL		
4. <u>Rho. torn.</u>	S	FAC	5			16. <u>Sal. pul.</u>	S	T	FAC		
5. <u>Bet. nan.</u>	S	FAC	5			17. <u>And. pol.</u>	S	T	FACW		
6. <u>Eri. flw.</u>	H	OBL	T			18. <u>Tri. bet.</u>	H	T	FACW		
7. <u>Sarc. can.</u>	H	FACW	S			19. <u>Sal. myr.</u>	S	5	FACW		
8. <u>Fax. arr.</u>	H	FAC	5			20.					
9. <u>Chl. can.</u>	H	FAC	T			21.					
⑩ <u>Rub. char.</u>	H	FACW	15			22. lichen					
11. <u>Pot. frv. (Des. For.)</u>	S	FAC	10			23. moss (feather / sphagnum)	70				
12. <u>Tri. ces.</u>	H	OBL	10			24. bare ground					

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species <u>105</u>	X1= <u>100</u>
FACW species <u>25</u>	X2= <u>50</u>
FAC species <u>45</u>	X3= <u>135</u>
FACU species <u>0</u>	X4= <u>0</u>
UPL + NL species <u>0</u>	X5= <u>0</u>
Column Totals: <u>170</u> (A) <u>285</u> (B)	
Prevalence Index = B/A = <u>1.68</u>	

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: OSGBJDWet Code: WENWI Code: BS/EMC

Hydrophytic Vegetation Indicators

Y Dominance Test is >50%

X Prevalence Index is ≤3.0

X Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S = 95/47.5/19 H = 75/37.5/15

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N
 Depth of Surface Water: 1-4" in low areas
 Water Table Present? Y N
 Depth to Water Table: 5"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☒
 Restrictive Layer w/in 24"? Y N
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y N
 Depth to saturation 0-5"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 5 (total)

Y Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
Y Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
Y Hydrogen Sulfide Odor (C1) 4"
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 3 (total)

N Water-Stained Leaves (B9)
Y Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
Y Geomorphic Position (D2)
N Shallow Aquitard (D3) (# frost)
N Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

Strong hydro indicators.

Aspect: N/A (cardinal) Slope: 0 %HGM Class: Slope Landform: BenchLocal relief: concave / convex/ noneMacrotopo (in poly): ConcaveMicrotopo: FlatAre climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y N

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: VPB

Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-5	Oi												
5-7	C	2.5Y 7/2	100	FSA-CO									
7-13	Oab												20% gravel

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4) -5"
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

Organic soils/saturated.

Other Soil Observations:Major Rooting Zone: 5 in.Cryoturbated? Y ☒ NThixotropic? Y ☒ N**Hydric Soils?**☒ Y ☐ N**Wetland Determination**

Hydrophytic Vegetation Present?

☒ Yes ☐ No

Wetland Hydrology Present?

☒ Yes ☐ No

Hydric Soils Present?

☒ Yes ☐ No

Plot Meets Wetland Criteria?

☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh #	226	Soil	
(4 veg photos in each direction, if different;	227	Soil	
2 soil photos: soil	228	N	
Profile and above pit)	229	E	
	230	S	
	231	W	



Plot Number: HDR5041_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5041_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5041_17 Description: Soil Date: 8/16/2017



Plot Number: HDR5041_17 Description: Soil Date: 8/16/2017

Archer Lat: N 59. 342.99 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5042-17Archer Long: W 154. 51900Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halstead 2) Dalzell 3) _____
 Bear Guard: Gust Observer: _____
 Do 'Normal Circumstances' Exist? YES (N) NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES (N) NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES (N) NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/16/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 22 map date: _____
 Township: 10 S Range: 31 W
 Section: 4 S.M. Quad No.: 342 B-5
 General Location (opt): _____
 Site marked on map? X

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
① <u>Aln vlv</u>	<u>S</u>	<u>FAC</u>	<u>70</u>	<u>6</u>		13.					
② <u>The phe(Phe.con.)</u>	<u>H</u>	<u>FACU</u>	<u>60</u>			14.					
③ <u>Cal ran</u>	<u>H</u>	<u>FAC</u>	<u>30</u>			15.					
4. <u>Opl hor</u>	<u>S</u>	<u>FACU</u>	<u>10</u>			16.					
5. <u>Ang lwr</u>	<u>H</u>	<u>FACU</u>	<u>3</u>			17.					
6. <u>Tr 20r.</u>	<u>H</u>	<u>FACU</u>	<u>3</u>			18.					
7. <u>Lyc 3el</u>	<u>H</u>	<u>NL</u>	<u>3</u>			19.					
8. <u>Sal pul</u>	<u>S</u>	<u>FAC</u>	<u>5</u>	<u>6</u>		20.					
9.						21.					
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by:
 OBL species 0 X1= 0
 FACW species 0 X2= 0
 FAC species 105 X3= 315
 FACU species 76 X4= 304
 UPL + NL species 3 X5= 15
 Column Totals: 184 (A) 634 (B)
 Prevalence Index = B/A= 3.45

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 66.6 (A/B)

Project Veg Type: CATS
 JDWet Code: 0
 ENWI Code: 0
 Hydrophytic Vegetation Indicators
 Dominance Test is >50%
 Prevalence Index is ≤3.0
 Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

(Y) N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S=85/42.5/17H=99/49.5/19.8

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y (N)
 Depth of Surface Water: _____
 Water Table Present? (Y) N
 Depth to Water Table: 16" weepy
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? (Y) N
 Depth to saturation 16"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
N High Water Table (A2)
N Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments:

Some saturation observed @ 16" around cobbles.

Aspect: N (cardinal) Slope: 23 % Local relief: concave / convex / none
 HGM Class: N/A Landform: Swale Macrotopo (in poly): FLAT Microtopo: FLAT
 Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

(Y) N

Soil Survey Map Unit: Exp Soil Survey of AK

Field Drainage Class: Well drained

Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.													
Depth (Inches)	Horizon Name	Color(s)	Matrix (%)	Texture	Type ¹	Color	Redox Features (%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-4	Oe												
4-5	C	2.5Y6/2	100	FSaL									
5-6	Oab												
6-10	B ₁ C	10YR3/3	100	FSaL								N	
10-18	B ₂ C	7.5YR2.5/2	100	BaL								N	60% cobbles

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

N

Histosol or Histel (A1)

N

Histic Epipedon (A2)

N

Hydrogen Sulfide (A4)

N

Thick Dark Surface (A12)

N

Alaska Gleyed (A13)

N

Alaska Redox (A14)

N

Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

N

Alaska Color Change (TA4)

N

Alaska Alpine Swales (TA5)

N

Alaska Redox with 2.5Y Hue (4a3)

N

Alaska Gleyed w/out Hue 5Y or Redder Underlying layer (4a4)

Other Hydric Soil Situations (see pg 88-91)³

N

Soils with Low Organic Carbon Content (4b1)

N

Soils with Low Weatherable Iron Content (4b2)

N

Soil pH Greater than 7.2 (4b3)

N

Recently Developed Wetland (4b4)

N

Positive α,α Test (60% of 4" layer) (4c)

N

Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Soil Comments:

No hydric soil indicators observed.

Other Soil Observations:

Major Rooting Zone: 6 in.

Cryoturbated? Y N

Thixotropic? Y N

Hydric Soils? Y N

Wetland Determination

Hydrophytic Vegetation Present? Yes No

Wetland Hydrology Present? Yes No

Hydric Soils Present? Yes No

Plot Meets Wetland Criteria? Yes Yes-Transitional No No-Transitional

Remarks:

Archer #

Photo #

Subject

Bearing

Ricoh #

(4 veg photos in each direction, if different;

2 soil photos: soil Profile and above pit)



Plot Number: HDR5042_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5042_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR5042_17 Description: Soil Date: 8/16/2017



Plot Number: HDR5042_17 Description: Soil Date: 8/16/2017

Archer Lat: N 59. 34144 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5043-17Archer Long: W 154. 4087Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halyk 2) Dalzell 3) _____
 Bear Guard: Gust Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/17/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 26 map date: _____
 Township: 10 S Range: 30 W
 Section: 6 S.M. Quad No.: 11B4
 General Location (opt): _____
 Site marked on map? X

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Aln. vir.</u>	<u>S</u>	<u>FAC</u>	<u>15</u>	<u>>8</u>		13. <u>Tri. ces.</u>	<u>H</u>	<u>OBL</u>	<u>35</u>		
2. <u>Bet. nan.</u>	<u>S</u>	<u>FAC</u>	<u>25</u>	<u>>8</u>		14. <u>Rub. cha.</u>	<u>H</u>	<u>FACW</u>	<u>10</u>		
3. <u>And. pol.</u>	<u>S</u>	<u>FACW</u>	<u>5</u>			15. <u>Eri. per.</u>	<u>H</u>	<u>FACW</u>	<u>15</u>		
4. <u>Sal. pul.</u>	<u>S</u>	<u>FAC</u>	<u>T</u>			16. <u>Fag. sci.</u>	<u>H</u>	<u>FACU</u>	<u>T</u>		
5. <u>Vacc. oxy.</u>	<u>S</u>	<u>OBL</u>	<u>T</u>			17. <u>Fag. arid.</u>	<u>H</u>	<u>FAC</u>	<u>T</u>		
6. <u>Sal. fus.</u>	<u>S</u>	<u>FACW</u>	<u>5</u>			18. <u>Call. can.</u>	<u>H</u>	<u>FAC</u>	<u>5</u>		
7. <u>Eri. ang.</u>	<u>H</u>	<u>OBL</u>	<u>5</u>			19. <u>Cor. sue.</u>	<u>H</u>	<u>FAC</u>	<u>T</u>		
8. <u>Viola long.</u>	<u>H</u>	<u>FACW</u>	<u>T</u>			20. <u>Car. agv.</u>	<u>H</u>	<u>OBL</u>	<u>5</u>		
9. <u>Pot. pal. (Com. pal.)</u>	<u>H</u>	<u>OBL</u>	<u>T</u>			21. <u>Tri. get.</u>	<u>H</u>	<u>FAC</u>	<u>5</u>		
10. <u>Car. sp. (macro)</u>	<u>H</u>	<u>FAC</u>	<u>10</u>			22. lichen					
11. <u>Car. sp. (macro)</u>	<u>H</u>	<u>FACW</u>	<u>T</u>			23. moss (feather / sphagnum)			<u>60</u>		
12. <u>Art. arc.</u>	<u>H</u>	<u>NL</u>	<u>5</u>			24. bare ground					

Prevalence Index worksheet:

Total % Cover of

Multiply by:

OBL species 45 X1= 45
 FACW species 35 X2= 70
 FAC species 80 X3= 240
 FACU species 0 X4= 0
 UPL + NL species 5 X5= 25
 Column Totals: 165 (A) 380 (B)
 Prevalence Index = B/A = 2.30

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: OMSSST
 JDWet Code: W
 ENWI Code: PEMI/SS/IB
 Hydrophytic Vegetation Indicators
 X Dominance Test is >50%
 Y Prevalence Index is ≤3.0
 Y Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Pot. Gr. S 5%, Tha. alp. H, T

S = 70/35/14

H = 95/47.5/19

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N
 Depth of Surface Water: 1-2 "in low areas
 Water Table Present? Y N
 Depth to Water Table: 5 "
 Just seeping in at this level, not yet filled to this level? (check if yes) X
 Restrictive Layer w/in 24"? Y N
 If Y, depth to Layer _____"
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____"
 Saturated Soil Present? Y N
 Depth to saturation 0 "surf.
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 3 (total)

Y Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 4 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
Y Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
Y Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
Y Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: N-E (cardinal) Slope: 12 %Local relief: concave / convex / noneHGM Class: Slope Landform: Swale Macrotopo (in poly): Concave Microtopo: hum-Small

Wetland Hydrology?

Are climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)Y N

Soils

PLOT NO: HDR 5043-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: PD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-6	Oi												
6-12	C	2.5Y 6/2	90	FSALO	C	10YR 5/6	10	RC, M		F			
12-19	B	2.5Y 4/2	80	FSALO	C	7.5YR 4/4	20	RC, M		C			

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ Histosol or Histel (A1)
- ☒ Histic Epipedon (A2)
- ☒ Hydrogen Sulfide (A4)
- ☒ Thick Dark Surface (A12)
- ☒ Alaska Gleyed (A13)
- ☒ Alaska Redox (A14)
- ☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
- ☒ Alaska Alpine Swales (TA5)
- ☒ Alaska Redox with 2.5Y Hue (4a3)
- ☒ Alaska Gleyed w/out Hue 5Y or Redder Underlying layer (4a4)

Other Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
- ☒ Soils with Low Weatherable Iron Content (4b2)
- ☒ Soil pH Greater than 7.2 (4b3)
- ☒ Recently Developed Wetland (4b4)
- ☒ Positive α,α Test (60% of 4" layer) (4c)
- ☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Soil Comments:

Other Soil Observations:

Major Rooting Zone: 10 in.

Cryoturbated? Y ☒ N

Thixotropic? Y ☒ N

Hydric Soils?

☒ Y ☐ N

Wetland Determination

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Wetland Hydrology Present? ☒ Yes ☐ No

Hydric Soils Present? ☒ Yes ☐ No

Plot Meets Wetland Criteria? ☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional

Remarks:

Archer # _____ Photo # _____ Subject _____ Bearing _____

Ricoh # 239 Soil _____

(4 veg photos in each direction, if different; 240 Soil _____

2 soil photos: soil 241 N _____

Profile and above pit) 242 E _____

243 S _____

244 W _____



Plot Number: HDR5043_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR5043_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR5043_17 Description: Soil Date: 8/17/2017



Plot Number: HDR5043_17 Description: Soil Date: 8/17/2017

Archer Lat: N 59. 34121 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5048-17Archer Long: W 154. 40956Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halstead 2) Dalzell 3) _____
 Bear Guard: Crust Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/17/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 20 map date: 8/11/17
 Township: 10 S Range: 30 W
 Section: 6 S.M. Quad No.: 112B-4
 General Location (opt): _____
 Site marked on map? Y

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also <u>water, rock, snags</u>	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Aln vir</u>	<u>S</u>	<u>FACU</u>	<u>90</u>	<u>25</u>		13.					
2. <u>Ang inc</u>	<u>H</u>	<u>FACU</u>	<u>T</u>			14.					
3. <u>Cal can</u>	<u>H</u>	<u>FACU</u>	<u>T</u>			15.					
4. <u>Lyc ambr (Sph ann)</u>	<u>H</u>	<u>FACU</u>	<u>25</u>			16.					
5. <u>Tri eur. la</u>	<u>H</u>	<u>FACU</u>	<u>15</u>			17.					
6. <u>Cham ang</u>	<u>H</u>	<u>FACU</u>	<u>10</u>			18.					
7. <u>Thu phe</u>	<u>H</u>	<u>FACU</u>	<u>20</u>			19.					
8. <u>Vacc uli</u>	<u>S</u>	<u>FACU</u>	<u>T</u>			20.					
9. <u>Sil ric</u>	<u>S</u>	<u>FACU</u>	<u>5</u>	<u>25</u>		21.					
10. <u>Bet gla</u>	<u>S</u>	<u>FACU</u>	<u>5</u>	<u>25</u>		22. lichen					
11.						23. moss (feather / sphagnum)	<u>30</u>				
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of

Multiply by:

OBL species 0 X1= 0
 FACW species 5 X2= 10
 FAC species 95 X3= 285
 FACU species 70 X4= 280
 UPL + NL species 0 X5= 0
 Column Totals: 170 (A) 565 (B)
 Prevalence Index = B/A = 3.82

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 25 (A/B)

Project Veg Type: CATSJDWet Code: 0ENWI Code: 0

Hydrophytic Vegetation Indicators

X Dominance Test is >50%

N Prevalence Index is ≤3.0

- Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S = 100 / 50 / 20 H = 70 / 35 / 14

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N
 Depth of Surface Water: _____
 Water Table Present? Y N
 Depth to Water Table: _____
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y N
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y N
 Depth to saturation _____
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
 High Water Table (A2)
 Saturation (A3)
 Water Marks (B1)
 Sediment Deposits (B2)
 Drift Deposits (B3)
 Algal Mat or Crust (B4)
 Marl Deposits (B15)
 Iron Deposits (B5)
 Surface Soil Cracks (B6)
 Inundation Visible on Aerial Imagery (B7)
 Sparsely Vegetated Concave Surface (B8)
 Hydrogen Sulfide Odor (C1)
 Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
 Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)
 Drainage Patterns (B10)
 Oxidized Rhizospheres on Living Roots (C3)
 Presence of Reduced Iron (C4)
 Salt Deposits (C5)
 Stunted or Stressed Plants (D1)
 Geomorphic Position (D2)
 Shallow Aquitard (D3) (# frost)
 Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments:

No hydro indicatorsAspect: MP (cardinal) Slope: 0 %HGM Class: N/A Landform: Hill slopeLocal relief: concave convex noneMacrotopo (in poly): Slightly concave Microtopo: Hum-mudAre climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y N



Plot Number: HDR5044_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR5044_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR5044_17 Description: Soil Date: 8/17/2017



Plot Number: HDR5044_17 Description: Soil Date: 8/17/2017

Archer Lat: N 59. 34094 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5046-17Archer Long: W 154. 40742Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halstead 2) Dalzell 3) _____
 Bear Guard: Gust Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/17 /2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska

Subregion: Western/Interior

Field Map: _____ map date: _____

Township: 10 S Range: 30 WSection: 6 S.M. Quad No.: ILL B-4

General Location (opt): _____

Site marked on map? Y

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Emp nig</u>	<u>S</u>	<u>FAC</u>	<u>70</u>	<u><3'</u>		13. <u>Sil ritz</u>	<u>S</u>	<u>FACW</u>	<u>7</u>	<u><5</u>	
2. <u>Vac uli</u>	<u>S</u>	<u>FAC</u>	<u>15</u>			14. <u>Ain vir</u>	<u>S</u>	<u>FAC</u>	<u>10</u>	<u><5</u>	
3. <u>Spi bea</u>	<u>S</u>	<u>FACW</u>	<u>5</u>			15. <u>Sil arc</u>	<u>S</u>	<u>FACW</u>	<u>5</u>		
4. <u>Led dec (Rhodon)</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			16. <u>HHie alp</u>	<u>H</u>	<u>NL</u>	<u>T</u>		
5. <u>Rub cha</u>	<u>H</u>	<u>FACW</u>	<u>3</u>			17.					
6. <u>Cor sev</u>	<u>H</u>	<u>FAC</u>	<u>5</u>			18.					
7. <u>Arc alp</u>	<u>H</u>	<u>FACW</u>	<u>3</u>			19.					
8. <u>Cal can</u>	<u>H</u>	<u>FAC</u>	<u>20</u>			20.					
9. <u>Vac vit</u>	<u>S</u>	<u>FACW</u>	<u>5</u>			21.					
10. <u>Cor viv</u>	<u>H</u>	<u>OBL</u>	<u>15</u>			22. lichen			<u>15</u>		
11. <u>Cha alp</u>	<u>H</u>	<u>FACW</u>	<u>3</u>			23. moss (feather / sphagnum)					
12. <u>Bet nan</u>	<u>S</u>	<u>FAC</u>	<u>10</u>			24. bare ground					

Prevalence Index worksheet:

Total % Cover of

Multiply by:

OBL species 15 X1= 15FACW species 10 X2= 20FAC species 140 X3= 420FACU species 16 X4= 64UPL + NL species 0 X5= 0Column Totals: 181 (A) 519 (B)Prevalence Index = B/A = 2.87

Dominance Test Worksheet:

Number of Dominant Species

That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant

Species Across All Strata: 3 (B)

Percent of Dominant Species

That are OBL, FACW, or FAC: 100 (A/B)Project Veg Type: DEST-HJDWet Code: 2ENWI Code: 2

Hydrophytic Vegetation Indicators

Y Dominance Test is >50%

Y Prevalence Index is ≤3.0

Y Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S = 132/66/26.4H = 49/24.5/9.8181

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N

Depth of Surface Water: _____

Water Table Present? Y N

Depth to Water Table: _____

Just seeping in at this level, not yet

filled to this level? (check if yes) ☐Restrictive Layer w/in 24"? Y N

If Y, depth to Layer _____

Restrictive Layer Type _____

If lateral flow, at what depth? _____

Saturated Soil Present? Y N

Depth to saturation _____

Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)N Surface Water (A1)

High Water Table (A2)

Saturation (A3)

Water Marks (B1)

Sediment Deposits (B2)

Drift Deposits (B3)

Algal Mat or Crust (B4)

Marl Deposits (B15)

Iron Deposits (B5)

Surface Soil Cracks (B6)

Inundation Visible on Aerial Imagery (B7)

Sparsely Vegetated Concave Surface (B8)

Hydrogen Sulfide Odor (C1)

Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)

Other (explain in Hydrology Comments)

Secondary Indicators 1 (total)N Water-Stained Leaves (B9)

Drainage Patterns (B10)

Oxidized Rhizospheres on Living

Roots (C3)

Presence of Reduced Iron (C4)

Salt Deposits (C5)

Stunted or Stressed Plants (D1)

Geomorphic Position (D2)

Shallow Aquitard (D3) (≠ frost)

Micro-topographic Relief (D4)

FAC-Neutral Test (D5)

Hydrology Comments:

No 1° hydro indicators/only 1 secondaryAspect: E (cardinal) Slope: 10 %HGM Class: MR Landform: Hill slopeLocal relief: concave / convex / noneMacrotopo (in poly): Slightly concaveMicrotopo: Moist hummocks

Wetland Hydrology?

Y NAre climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)Field QC'ed (initial & date): 3/17/12

Soils

PLOT NO: HDR 5046-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: _____ Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-5	Oe												
5-8	C	2.5Y6/1	100	VFSal									Ash
8-12	A	7.5YR2.5/1	100	SIL								N	
12-18		7.5YR2.5/1	30	SIL								N	70% Boulders

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ Histosol or Histel (A1)
- ☐ Histic Epipedon (A2)
- ☐ Hydrogen Sulfide (A4)
- ☐ Thick Dark Surface (A12)
- ☐ Alaska Gleyed (A13)
- ☐ Alaska Redox (A14)
- ☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
- ☐ Alaska Alpine Swales (TA5)
- ☐ Alaska Redox with 2.5Y Hue (4a3)
- ☐ Alaska Gleyed w/out Hue 5Y or Redder Underlying layer (4a4)

Other Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
- ☐ Soils with Low Weatherable Iron Content (4b2)
- ☐ Soil pH Greater than 7.2 (4b3)
- ☐ Recently Developed Wetland (4b4)
- ☐ Positive α,α Test (60% of 4" layer) (4c)
- ☐ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Soil Comments:

Other Soil Observations:

Major Rooting Zone: 10 in. Cryoturbated? Y ☒ N Thixotropic? Y ☒ N

Hydric Soils? Y ☒ N

Wetland Determination

Hydrophytic Vegetation Present?	<input checked="" type="radio"/> Yes <input type="radio"/> No	Plot Meets Wetland Criteria? Yes Yes-Transitional <input checked="" type="radio"/> No No-Transitional
Wetland Hydrology Present?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Hydric Soils Present?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Remarks:		

Archer # _____	Photo # _____	Subject _____	Bearing _____
Ricoh # _____	255	SOIL	
(4 veg photos in each direction, if different;	256	SOIL	
2 soil photos: soil	257	7 Veg	N
Profile and above pit)	258		E
	259		S
	260		W



Plot Number: HDR5046_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR5046_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR5046_17 Description: Soil Date: 8/17/2017



Plot Number: HDR5046_17 Description: Soil Date: 8/17/2017

Archer Lat: N 59. 34159 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5050-17Archer Long: W 154. 40218Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halskard 2) Dalzell 3) _____
 Bear Guard: Gust Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/17/2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska

Subregion: Western/Interior

Field Map: 26 map date: _____Township: 10 S Range: 32 WSection: 6 S.M. Quad No.: III B-4

General Location (opt): _____

Site marked on map? X

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Sal. pul.</u>	<u>S</u>	<u>FAC</u>	<u>15</u>	<u>45</u>		13. <u>Ach. mil.</u>	<u>H</u>	<u>FACU</u>	<u>5</u>		
2. <u>Vac. uli.</u>	<u>S</u>	<u>FAC</u>	<u>25</u>			14. <u>Cha. ang.</u>	<u>H</u>	<u>FACU</u>	<u>25</u>		
3. <u>Emp. nig.</u>	<u>S</u>	<u>FAC</u>	<u>25</u>			15. <u>Car. mac.</u> <u>(C)</u>	<u>H</u>	<u>FACW</u>	<u>25</u>		
4. <u>Sal. glab.</u>	<u>S</u>	<u>FAC</u>	<u>15</u>	<u>45</u>		16. <u>Eg. arr.</u>	<u>S</u>	<u>FAC</u>	<u>5</u>		
5. <u>Sp. hear (Spi. str.)</u>	<u>S</u>	<u>FACU</u>	<u>5</u>			17. <u>R. b. cha.</u>	<u>S</u>	<u>FACW</u>	<u>5</u>		
6. <u>Vac. vit.</u>	<u>S</u>	<u>FACU</u>	<u>5</u>			18. <u>San. can.</u>	<u>S</u>	<u>FACW</u>	<u>10</u>		
7. <u>Sal. rich.</u>	<u>S</u>	<u>FACW</u>	<u>15</u>			19. <u>Eri. per.</u>	<u>S</u>	<u>FACW</u>	<u>5</u>		
8. <u>Bet. nam.</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			20. <u>Ang. luc.</u>	<u>S</u>	<u>FACU</u>	<u>5</u>		
9. <u>Willow</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			21. <u>Net. vir. alp</u>	<u>S</u>	<u>FAC</u>	<u>5</u>		
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species <u>0</u>	X1= <u>0</u>
FACW species <u>60</u>	X2= <u>120</u>
FAC species <u>95</u>	X3= <u>285</u>
FACU species <u>35</u>	X4= <u>140</u>
UPL + NL species <u>0</u>	X5= <u>0</u>
Column Totals: <u>190</u> (A) <u>545</u> (B)	
Prevalence Index = B/A= <u>2.87</u>	

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 6 (A)
 Total Number of Dominant Species Across All Strata: 7 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 85.7 (A/B)

Project Veg Type: OWL SJDWet Code: 5ENWI Code: 5

Hydrophytic Vegetation Indicators

X Dominance Test is >50%X Prevalence Index is ≤3.07 Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

(Y) N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S=110/55/22 80/40/16

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y (N)
 Depth of Surface Water: _____
 Water Table Present? (Y) (N)
 Depth to Water Table: 12 "
 Just seeping in at this level, not yet filled to this level? (check if yes) (X)
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? (Y) (N)
 Depth to saturation 7 "
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 1 (total)

N Surface Water (A1)
N High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 2 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
Y Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments: Recent rain/previous day eveningAspect: E (cardinal) Slope: 7 %HGM Class: N/A Landform: Toe slope Macrotopo (in poly): Slightly concave Microtopo: Hum largeAre climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

(Y) N

PLOT NO: HDR 5850-17

Indicators of possible andic properties: smeary / low bulk density

Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

Primary Indicators

- N Histosol or Histel (A1)
- N Histic Epipedon (A2) - close
- N Hydrogen Sulfide (A4)
- N Thick Dark Surface (A12)
- N Alaska Gleyed (A13)
- N Alaska Redox (A14)
- N Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

N Alaska Color Change (TA4)
N Alaska Alpine Swales (TA5)
N Alaska Redox with 2.5Y Hue (4a3)
N Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

N Soils with Low Organic Carbon Content (4b1)
N Soils with Low Weatherable Iron Content (4b2)
N Soil pH Greater than 7.2 (4b3)
N Recently Developed Wetland (4b4)
N Positive α, α Test (60% of 4" layer) (4c)
N Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

Other Soil Observations:

Major Rooting Zone: 10 in.

Cryoturbated? Y N

Thixotropic? Y ☒ N

Hydric Soils?

Y N

Wetland Determination

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No
Hydric Soils Present? ☐ Yes ☒ No
Plot Meets Wetland Criteria? ☐ Yes ☐ Yes-Transitional ☒ No ☐ No-Transitional

Remarks:

Archer # _____	Photo # _____	Subject _____	Bearing _____
Ricoh # _____	<u>272</u>	<u>Soil</u>	_____
(4 veg photos in each	<u>273</u>	<u>Soil</u>	_____
direction, if different;	<u>274</u>	<u>N</u>	_____
2 soil photos: soil	<u>275</u>	<u>E</u>	_____
Profile and above pit)	<u>276</u>	<u>S</u>	_____
	<u>277</u>	<u>N</u>	_____



Plot Number: HDR5050_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR5050_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR5050_17 Description: Soil Date: 8/17/2017



Plot Number: HDR5050_17 Description: Soil Date: 8/17/2017

Archer Lat: N 59. 34.795 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5053-17Archer Long: W 154. 37033Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halsstead 2) Dalzell 3) _____
 Bear Guard: GUST Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/17/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 27 map date: _____
 Township: 9 S Range: 30 W
 Section: 32 S.M. Quad No.: 141 B-4
 General Location (opt): _____
 Site marked on map? X

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also <u>water, rock, snags</u>	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Aln. vir.</u>	<u>S</u>	<u>FAC</u>	<u>30</u>	<u>25</u>		13. <u>Cal. can.</u>	<u>H</u>	<u>FAC</u>	<u>10</u>		
2. <u>Emp. n. lg.</u>	<u>1</u>	<u>FAC</u>	<u>40</u>			14. <u>Cor. s. sl.</u>	<u>H</u>	<u>FAC</u>	<u>5</u>		
3. <u>Vac. vit.</u>		<u>FAC</u>	<u>20</u>			15. <u>Cor. big.</u>	<u>H</u>	<u>FAC</u>	<u>5</u>		
4. <u>Rub. nam.</u>		<u>FAC</u>	<u>10</u>			16. <u>Ang. l. l.</u>	<u>H</u>	<u>FACU</u>	<u>7</u>		
5. <u>Rub. l. om.</u>		<u>FAC</u>	<u>5</u>			17.					
6. <u>Vac. vit.</u>		<u>FAC</u>	<u>10</u>			18.					
7. <u>Sal. gl.</u>		<u>FAC</u>	<u>5</u>			19.					
8. <u>S. l. p. r. c.</u>		<u>FACU</u>	<u>10</u>			20.					
9. <u>Spi. h. l. a. (Spi. St.)</u>	<u>V</u>	<u>FACU</u>	<u>5</u>			21.					
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of

Multiply by:

OBL species 0 X1= 0
 FACW species 0 X2= 0
 FAC species 140 X3= 420
 FACU species 15 X4= 60
 UPL + NL species 10 X5= 0
 Column Totals: 155 (A) 480 (B)
 Prevalence Index = B/A= 3.10

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: OALSJDWet Code: UENWI Code: U

Hydrophytic Vegetation Indicators

X Dominance Test is >50%

N Prevalence Index is ≤3.0

— Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

(Y) N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

OALS over DEST-H, overall poly is OALS.
S=135/67.5/27 H=20/16/4

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y (N)
 Depth of Surface Water: _____"
 Water Table Present? Y (N)
 Depth to Water Table: _____"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____"
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____"
 Saturated Soil Present? Y (N)
 Depth to saturation _____"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
N High Water Table (A2)
N Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 1 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: SE (cardinal) Slope: 8 % Local relief: concave / convex none
 HGM Class: N/A Landform: fast/sloped Macrotopo (in poly): Flat Microtopo: Hum-large
 Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

(Y) (N)

Soils

PLOT NO: HDR 5053-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Redox Features Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-3	Oi												
3-5	Oe												
5-8	C ₁	2.5Y 7/2	100	FSALO									
8-9	O _{eb}												
9-11		2.5Y 5/3	100	FSALO									
11-12		10YR 4/4	100	SALO									
12-15		7.5YR 2.5/3	100	SALO									

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators	Indicators for Problematic Hydric Soils³	Other Hydric Soil Situations (see pg 88-91)³
<input checked="" type="checkbox"/> Histosol or Histel (A1)	<input checked="" type="checkbox"/> Alaska Color Change (TA4)	<input checked="" type="checkbox"/> Soils with Low Organic Carbon Content (4b1)
<input checked="" type="checkbox"/> Histic Epipedon (A2)	<input checked="" type="checkbox"/> Alaska Alpine Swales (TA5)	<input checked="" type="checkbox"/> Soils with Low Weatherable Iron Content (4b2)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input checked="" type="checkbox"/> Alaska Redox with 2.5Y Hue (4a3)	<input checked="" type="checkbox"/> Soil pH Greater than 7.2 (4b3)
<input checked="" type="checkbox"/> Thick Dark Surface (A12)	<input checked="" type="checkbox"/> Alaska Gleyed w/out Hue 5Y or Redder	<input checked="" type="checkbox"/> Recently Developed Wetland (4b4)
<input checked="" type="checkbox"/> Alaska Gleyed (A13)	<input checked="" type="checkbox"/> Underlying layer (4a4)	<input checked="" type="checkbox"/> Positive α,α Test (60% of 4" layer) (4c)
<input checked="" type="checkbox"/> Alaska Redox (A14)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic	<input checked="" type="checkbox"/> Soil determined to be ponded, flooded, H ₂ O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)
<input checked="" type="checkbox"/> Alaska Gleyed Pores (A15)		

Soil Comments: Refusal @ 15", boulders.

Other Soil Observations:	Hydric Soils?
Major Rooting Zone: <u>6</u> in. Cryoturbated? Y <input checked="" type="checkbox"/> Thixotropic? Y <input checked="" type="checkbox"/>	Y <input checked="" type="checkbox"/>

Wetland Determination

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Archer # _____	Photo # _____	Subject _____	Bearing _____
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Ricoh # _____	<u>285</u>	<u>N</u>	_____
Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	(4 veg photos in each direction, if different;	<u>286</u>	<u>E</u>	_____
Plot Meets Wetland Criteria? Yes Yes-Transitional <input checked="" type="checkbox"/> No No-Transitional	2 soil photos: soil Profile and above pit)	<u>287</u>	<u>S</u>	_____
Remarks:		<u>288</u>	<u>W</u>	_____
		<u>289</u>	<u>Soil</u>	_____
		<u>290</u>	<u>Soil</u>	_____



Plot Number: HDR5053_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR5053_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR5053_17 Description: Soil Date: 8/17/2017



Plot Number: HDR5053_17 Description: Soil Date: 8/17/2017

Archer Lat: N 59. 34748 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6055-17Archer Long: W 154. 371.99Wetland? (Y) Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halsland 2) Dalzell 3) _____
 Bear Guard: GUST Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/17 /2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: _____ map date: _____
 Township: 9 S Range: 30 W
 Section: 32 S.M. Quad No.: ILL B-4
 General Location (opt): _____
 Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also <u>water, rock, snags</u>	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>VAC uli</u>	S	FAC	<u>60</u>	<u><8</u>		13. <u>Art arc</u>	H	NL	<u>3</u>		
2. <u>SAL owl</u>	S	FAC	<u>15</u>			14. <u>BRC per</u>	H	FACW	<u>T</u>		
3. <u>Emp nrg</u>	S	FAC	<u>20</u>			15. <u>Aln vtr</u>	S	FAC	<u>T</u>		
4. <u>Tri ces</u>	H	DBL	<u>20</u>			16. <u>vac vtr</u>	H	NL	<u>T</u>		
5. <u>Bet nam</u>	S	FAC	<u>5</u>			17. <u>Hter alp</u>	H	NL	<u>3</u>		
6. <u>Cal ram</u>	H	FAC	<u>15</u>			18. <u>Cha m</u>	H	FACU	<u>T</u>		
7. <u>Led dec (Ph. tom)</u>	S	FAC	<u>10</u>			19. <u>VAC vit</u>	S	FAC	<u>3</u>		
8. <u>Pin sev</u>	H	FAC	<u>T</u>			20.					
9. <u>Rub cha</u>	H	FACW	<u>5</u>			21.					
10. <u>Carex mlt</u>	H	FAC	<u>25</u>			22. lichen					
11. <u>Pot fri</u>	H	FACW	<u>T</u>			23. moss (feather / sphagnum)					
12. <u>Spi bpa (Sp. ste)</u>	S	FACU	<u>5</u>			24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by: _____
 OBL species 20 X1= 20
 FACW species 5 X2= 10
 FAC species 153 X3= 459
 FACU species 5 X4= 20
 UPL + NL species 6 X5= 30
 Column Totals: 189 (A) 539 (B)
 Prevalence Index = B/A= 2.85

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: DEFT-C
 JDWet Code: W
 ENWI Code: DSUTEMALC
 Hydrophytic Vegetation Indicators
 Y Dominance Test is >50%
 Y Prevalence Index is ≤3.0
 Y Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

(Y) N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S = 118/59/23.6 H = 71/35.5/14.2

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y (N)
 Depth of Surface Water: _____
 Water Table Present? (Y) N
 Depth to Water Table: 3 "
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____ "
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____ "
 Saturated Soil Present? Y (N)
 Depth to saturation 0 "
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 3 (total)

N Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
Y Surface Soil Cracks (B6)
Y Inundation Visible on Aerial Imagery (B7)
Y Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
 Other (explain in Hydrology Comments)

Secondary Indicators 2 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
Y Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: S (cardinal) Slope: 5 % Local relief: concave / convex / none
 HGM Class: Slope Landform: Toc slope Macrotopo (in poly): concave Microtopo: Mod hummocks
 Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

(Y) N



Plot Number: HDR5055_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR5055_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR5055_17 Description: Soil Date: 8/17/2017



Plot Number: HDR5055_17 Description: Soil Date: 8/17/2017

Archer Lat: N 59. 33781 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5061-17Archer Long: W 154. 29962Wetland? (Y) Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Haishead 2) Dalzell 3) _____
 Bear Guard: GUST Observer: _____
 Do 'Normal Circumstances' Exist? (YES) YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? (YES) YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? (YES) YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/17/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 29 map date: 8/11/17
 Township: 10 S Range: 20 W
 Section: 2 S.M. Quad No.: 141 B-4
 General Location (opt): _____
 Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Vac vli</u>	<u>S</u>	<u>FAC</u>	<u>10</u>			13. <u>Car am</u>	<u>H</u>	<u>OBL</u>	<u>10</u>		
2. <u>Emp nig</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			14. <u>Car Sax</u>	<u>H</u>	<u>FACW</u>	<u>10</u>		
3. <u>Led dec (Rhamn.)</u>	<u>S</u>	<u>FAC</u>	<u>T</u>			15. <u>Bet nm</u>	<u>S</u>	<u>FAC</u>	<u>T</u>		
4. <u>Sal pul</u>	<u>S</u>	<u>FACW</u>	<u>3</u>			16. <u>Eri per</u>	<u>H</u>	<u>FACW</u>	<u>T</u>		
5. <u>Arz alp</u>	<u>H</u>	<u>FACW</u>	<u>5</u>			17. <u>Aln vtr</u>	<u>S</u>	<u>FAC</u>	<u>10</u>	<u>25</u>	
6. <u>Eaw an</u>	<u>H</u>	<u>FAC</u>	<u>5</u>			18. <u>And pol</u>	<u>S</u>	<u>FACW</u>	<u>T</u>		
7. <u>Cal am</u>	<u>H</u>	<u>FAC</u>	<u>10</u>			19. <u>Vac vit</u>	<u>S</u>	<u>FACW</u>	<u>T</u>		
8. <u>Eri sch</u>	<u>H</u>	<u>OBL</u>	<u>30</u>			20.					
9. <u>Car Sax</u>	<u>H</u>	<u>FACW</u>	<u>10</u>			21.					
10. <u>Artemisa orl</u>	<u>H</u>	<u>NL</u>	<u>5</u>			22. lichen			<u>15</u>		
11. <u>Sal ar</u>	<u>S</u>	<u>FACW</u>	<u>T</u>			23. moss (feather / sphagnum)			<u>30</u>		
12. <u>Tr ces</u>	<u>H</u>	<u>OBL</u>	<u>20</u>			24. bare ground <u>OW</u>			<u>20</u>		

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species <u>60</u>	X1= <u>60</u>
FACW species <u>20</u>	X2= <u>40</u>
FAC species <u>43</u>	X3= <u>129</u>
FACU species <u>5</u>	X4= <u>20</u>
UPL + NL species <u>5</u>	X5= <u>25</u>
Column Totals: <u>133</u> (A)	<u>274</u> (B)
Prevalence Index = B/A = <u>2.06</u>	

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 8 (A)
 Total Number of Dominant Species Across All Strata: 8 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: SSMUMJDWet Code: WENWI Code: DEM/SSI B

Hydrophytic Vegetation Indicators

Y Dominance Test is >50%

X Prevalence Index is ≤3.0

X Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S = 28/14/5.6 H = 105/52.5/21

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? (Y) N
 Depth of Surface Water: 6-12 in pools
 Water Table Present? (Y) N
 Depth to Water Table: 8"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? (Y) N
 Depth to saturation 6"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 4 (total)

Y Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
Y Water Marks (B1)
Y Sediment Deposits (B2)
Y Drift Deposits (B3)
Y Algal Mat or Crust (B4)
Y Marl Deposits (B15)
Y Iron Deposits (B5)
Y Surface Soil Cracks (B6)
Y Inundation Visible on Aerial Imagery (B7)
Y Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 4 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
Y Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
Y Shallow Aquitard (D3) (≠ frost)
Y Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: S (cardinal) Slope: 3 %HGM Class: SlopeLandform: ToeslopeMacrotopo (in poly): SlightlyMicrotopo: Large hummocksAre climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

(Y) N

Soils

PLOT NO: HDR 606-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: peaty Drained Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.													
Depth (Inches)	Horizon Name	Matrix			Redox Features							Horizon Comments	
		Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)		α-α (Y, N; >30 sec)
0-3	Oi												
3-4	Oe												
4-8	C	2.5Y 6/2	80	VFSaL	C	7.5YR 4/6	20	M, R		m		Y	
8-9	Oeb												
9-20	B	2.5Y 4/2	95	GSiL	C	5YR 3/3	5	M, PL		m		Y	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators	Indicators for Problematic Hydric Soils ³	Other Hydric Soil Situations (see pg 88-91) ³
<input checked="" type="checkbox"/> Histosol or Histel (A1)	<input checked="" type="checkbox"/> Alaska Color Change (TA4)	<input checked="" type="checkbox"/> Soils with Low Organic Carbon Content (4b1)
<input checked="" type="checkbox"/> Histic Epipedon (A2)	<input checked="" type="checkbox"/> Alaska Alpine Swales (TA5)	<input checked="" type="checkbox"/> Soils with Low Weatherable Iron Content (4b2)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input checked="" type="checkbox"/> Alaska Redox with 2.5Y Hue (4a3)	<input checked="" type="checkbox"/> Soil pH Greater than 7.2 (4b3)
<input checked="" type="checkbox"/> Thick Dark Surface (A12)	<input checked="" type="checkbox"/> Alaska Gleyed w/out Hue 5Y or Redder	<input checked="" type="checkbox"/> Recently Developed Wetland (4b4)
<input checked="" type="checkbox"/> Alaska Gleyed (A13)	<input checked="" type="checkbox"/> Underlying layer (4a4)	<input checked="" type="checkbox"/> Positive α,α Test (60% of 4" layer) (4c)
<input checked="" type="checkbox"/> Alaska Redox (A14)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic	<input checked="" type="checkbox"/> Soil determined to be ponded, flooded, H ₂ O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)
<input checked="" type="checkbox"/> Alaska Gleyed Pores (A15)		

Soil Comments:

Positive old and strong hydro/vege indicators. Almost meets AK Redox 2.5 but redox off by one value (chroma) in 9-20 layer.

Other Soil Observations: Major Rooting Zone: 6 in. Cryoturbated? Y ☒ N Thixotropic? Y ☒ N Hydric Soils? ☒ Y ☐ N

Wetland Determination

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No
Hydric Soils Present? ☒ Yes ☐ No
Plot Meets Wetland Criteria? ☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh #	314	SOIL	
(4 veg photos in each direction, if different;	320	SOIL	
2 soil photos: soil	321	veg	N
Profile and above pit)	322	"	E
	323	"	S
	324	"	W



Plot Number: HDR5061_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR5061_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR5061_17 Description: Soil Date: 8/17/2017



Plot Number: HDR5061_17 Description: Soil Date: 8/17/2017

Archer Lat: N 59. 33907 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5063-17Archer Long: W 154. 29919Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halstead 2) Dulzell 3) _____
 Bear Guard: Gust Observer: _____
 Do 'Normal Circumstances' Exist? YES (N) NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES (N) NO
(Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES (N) NO
(Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/17/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 29 map date: _____
 Township: 10 S Range: 30 W
 Section: 2 S.M. Quad No.: III B-4
 General Location (opt): _____
 Site marked on map? X

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
① <u>Aln. frax.</u>	<u>S</u>	<u>FAC</u>	<u>50</u>	<u><5</u>		⑬ <u>Can. big.</u>	<u>H</u>	<u>FAC</u>	<u>10</u>		
② <u>Emp. nig.</u>		<u>FAC</u>	<u>25</u>			⑭ <u>Eg. s. atv.</u>		<u>FAC</u>	<u>5</u>		
3. <u>Vac. vit.</u>		<u>FAC</u>	<u>20</u>			⑮ <u>Chl. can.</u>		<u>FAC</u>	<u>10</u>		
4. <u>Sal. pul.</u>		<u>FAC</u>	<u>5</u>			⑯ <u>Ach. mil.</u>		<u>FAC</u>	<u>5</u>		
5. <u>Sal. gla.</u>		<u>FAC</u>	<u>T</u>			⑰ <u>Cha. ang.</u>		<u>FAC</u>	<u>5</u>		
6. <u>Rho. tom.</u>		<u>FAC</u>	<u>10</u>			18. <u>Ang. lvc.</u>		<u>FAC</u>	<u>T</u>		
7. <u>Bet. nan.</u>		<u>FAC</u>	<u>10</u>			19. <u>Cor. sic.</u>	<u>Y</u>	<u>FAC</u>	<u>T</u>		
8. <u>Bet. gla.</u>		<u>FAC</u>	<u>T</u>			20. <u>Vac. vit.</u>	<u>S</u>	<u>FAC</u>	<u>T</u>		
9. <u>Sal. rh.</u>	<u>Y</u>	<u>FACW</u>	<u>5</u>			⑳ <u>Lyc. ann (Spi. ann.)</u>	<u>H</u>	<u>FAC</u>	<u>5</u>		
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground	<u>Rock.</u>		<u>5</u>		

Prevalence Index worksheet:

Total % Cover of

Multiply by:

OBL species 0 X1= 0
 FACW species 5 X2= 10
 FAC species 145 X3= 435
 FACU species 15 X4= 60
 UPL + NL species 0 X5= 0
 Column Totals: 165 (A) 505 (B)
 Prevalence Index = B/A= 3.06

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)
 Total Number of Dominant Species Across All Strata: 8 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 62.5 (A/B)

Project Veg Type: OALSJDWet Code: 2ENWI Code: 2

Hydrophytic Vegetation Indicators

Dominance Test is >50%

Prevalence Index is ≤3.0

Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

(Y) N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Exposed boulders present.

S=125/62.5/25

H=40/20/8

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y (N)
 Depth of Surface Water: _____
 Water Table Present? Y (N)
 Depth to Water Table: _____
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y (N)
 Depth to saturation _____
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
N High Water Table (A2)
N Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments:

No hydro indicators observed.

Aspect: S (cardinal) Slope: 5 %Local relief: concave / convex / noneHGM Class: N/A Landform: Tx slopeMacrotopo (in poly): FlatMicrotopo: Hum - large

Wetland Hydrology?

Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)Y (N)

Soils

PLOT NO: HDR 5063-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-3	Oi												
3-4	B ₁	10YR4/3	100	FSAL									
4-6	B ₂	2.5Y4/3	100	SAL									
6-7	B ₃	7.5YR4/4	100	SAL									
7-12	B ₄	2.5Y4/2	100	FSAL									

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: Redox @ 12. Profile dry throughout.**Other Soil Observations:**Major Rooting Zone: 6 in.Cryoturbated? Y ☒ NThixotropic? Y ☒ N**Hydric Soils?**Y ☒ N**Wetland Determination****Hydrophytic Vegetation Present?**Yes ☒ No**Wetland Hydrology Present?**Yes ☒ No**Hydric Soils Present?**Yes ☒ No**Plot Meets Wetland Criteria?**Yes Yes-Transitional ☒ No No-Transitional**Remarks:**

Archer #	Photo #	Subject	Bearing
Ricoh #	329	Soil	
(4 veg photos in each direction, if different;	330	Soil	
2 soil photos: soil	331	N	
Profile and above pit)	332	E	
	333	S	
	334	W	



Plot Number: HDR5063_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR5063_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR5063_17 Description: Soil Date: 8/17/2017



Plot Number: HDR5063_17 Description: Soil Date: 8/17/2017

Archer Lat: N 59. 30338 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5147-17Archer Long: W 154. 11829Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) W. G. Wren 2) Halstead 3) _____
 Bear Guard: Trefon G. Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/31/2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska

Subregion: Western/Interior

Field Map: 36 map date: _____Township: 10S Range: 29WSection: 14 S.M. Quad No.: 41 B-3

General Location (opt): _____

Site marked on map? Y**Vegetation** Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. Myr gal	S	OBLW	10			13. Cal can	H	FAC	80		
2. Sal pup	I	FAC	25			14. Vio pal		FACW	T		
3. Com pal		OBLW	3			15. Rub arc		FAC	3		
4. Sal bar	↓	FAC	10			16. Car mic		FAC	3		
5.						17. Iri set		FAC	15		
6.						18. Equ arv		FAC	10		
7.						19. Cor soc.	↓	FAC	3		
8.						20.					
9.						21.					
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by: _____
 OBL species 13 X1= 13
 FACW species 0 X2= 0
 FAC species 149 X3= 447
 FACU species 0 X4= 0
 UPL + NL species 0 X5= 0
 Column Totals: 162 (A) 460 (B)
 Prevalence Index = B/A = 2.84

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100% (A/B)

Project Veg Type: BH
 JDWet Code: U
 ENWI Code: U
 Hydrophytic Vegetation Indicators
 Y Dominance Test is >50%
 X Prevalence Index is ≤3.0
 X Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
Y N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments: Myrica is in thin bands visible in imagery.
Shrub = 48, 24, 9.6 Herb = 114, 57, 22.8

Hydrology**Observations** (Measured from grnd surface):

Surface Water Present? Y N
 Depth of Surface Water: _____
 Water Table Present? Y N
 Depth to Water Table: _____
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y N
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y N
 Depth to saturation _____
 Epi Endo Unknown (circle type of sat.) _____

2007 AK Supplement Hydrology Indicators (Measure from ground surface)**Primary Indicators** 0 (total)

N Surface Water (A1)
N High Water Table (A2)
N Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 1 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments: A Micro-high area w/in larger flat near coast.

Aspect: _____ (cardinal) Slope: 0 %HGM Class: N/A Landform: FlatLocal relief: concave / convex / noneMacrotopo (in poly): Convex Microtopo: Hum-medAre climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Wetland Hydrology?
Y N

Soils

PLOT NO: HDR 5147-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-1	Oi												
1-2	Oe												
2-6	D/c	10YR 6/2	100	FSALC									Ash
6-10	B ₁	10YR 7/3	100	SALC									
10-20	B ₂	10YR 4/1	70	SILC	C	7.5YR 4/30	M, PL			C		negative	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

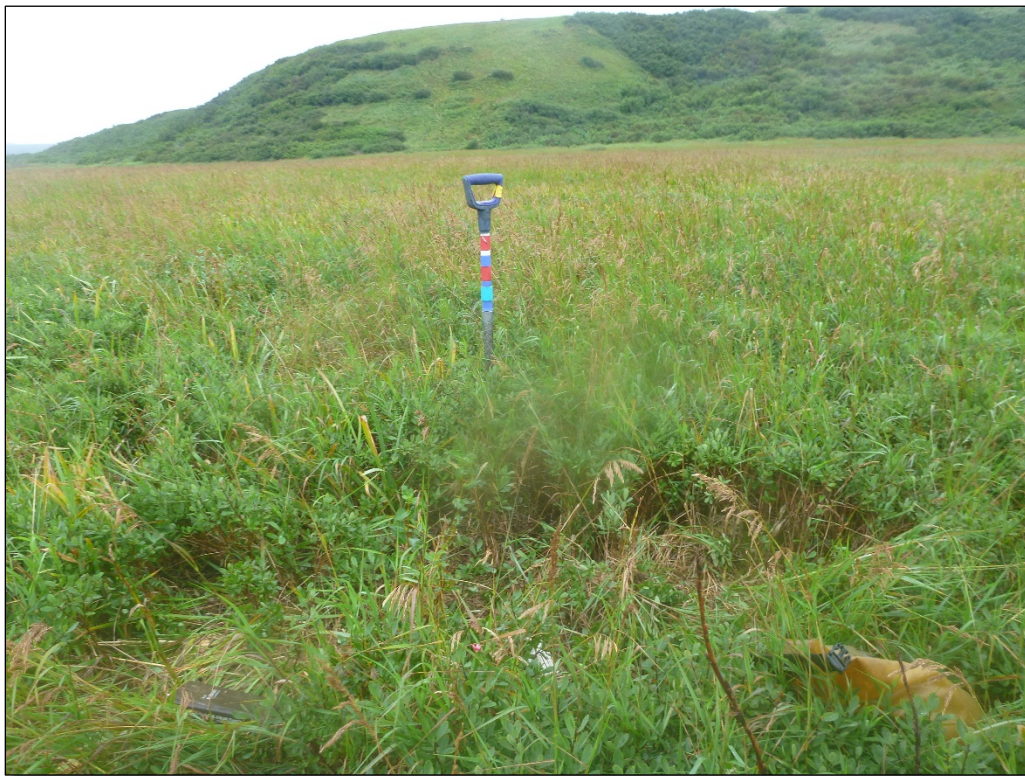
- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α_a Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: Dry, sandy soils. No hydric soil indicators.**Other Soil Observations:**Major Rooting Zone: 12 in.Cryoturbated? Y ☒ NThixotropic? Y ☒ N**Hydric Soils?**Y ☒ N**Wetland Determination****Hydrophytic Vegetation Present?**Yes ☒ No**Wetland Hydrology Present?**Yes ☒ No**Hydric Soils Present?**Yes ☒ No**Plot Meets Wetland Criteria?**Yes Yes-Transitional ☒ No No-Transitional**Remarks:** Plot is w/in higher area, SEMW and OSGB to North.

Archer #	Photo #	Subject	Bearing
Ricoh #	740	Soil	-
(4 veg photos in each direction, if different;	741	Soil	-
2 soil photos: soil	742	Veg	N
Profile and above pit)	743	↓	E
	744	↓	S
	745	↓	W



Plot Number: HDR5147_17 **Description:** Vegetation **Date:** 8/31/2017



Plot Number: HDR5147_17 **Description:** Vegetation **Date:** 8/31/2017



Plot Number: HDR5147_17 Description: Soil Date: 8/31/2017



Plot Number: HDR5147_17 Description: Soil Date: 8/31/2017

Archer Lat: N 59. 35909 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5149-17Archer Long: W 154. 60548Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Holbrook 2) Wynne 3) _____
 Bear Guard: G. Treloar Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/31/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 19 map date: 8/25/17
 Township: 9S Range: 32W
 Section: 36 S.M. Quad No.: 12B-5
 General Location (opt): _____
 Site marked on map? X

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs # woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
① <u>Emp. nig.</u>	<u>S</u>	<u>FAC</u>	<u>50</u>	<u><3"</u>		⑬ <u>Car. mic.</u>	<u>H</u>	<u>FAC</u>	<u>10</u>		
② <u>Vac. vit.</u>		<u>FAC</u>	<u>15</u>			⑭ <u>Cal. can.</u>	<u>I</u>	<u>FAC</u>	<u>5</u>		
③ <u>Red. ran.</u>		<u>FAC</u>	<u>15</u>			⑮ <u>Art. arc.</u>	<u>↓</u>	<u>NL</u>	<u>T</u>		
④ <u>Rho. tom.</u>		<u>FAC</u>	<u>10</u>			⑯ <u>Cor. sue.</u>		<u>FAC</u>	<u>T</u>		
⑤ <u>Vac. vit.</u>		<u>FAC</u>	<u>5</u>			⑰					
⑥ <u>Sal. pul.</u>		<u>FAC</u>	<u>7</u>			⑱					
⑦ <u>Arc. alp.</u>		<u>FACU</u>	<u>3</u>			⑲					
⑧ <u>Sal. par.</u> ©	<u>↓</u>	<u>FAC</u>	<u>T</u>			⑳					
⑨						㉑					
⑩						㉒ lichen					
⑪						㉓ moss (feather / sphagnum)					
⑫						㉔ bare ground					

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species 0 X1= 0
 FACW species 0 X2= 0
 FAC species 117 X3= 351
 FACU species 3 X4= 12
 UPL + NL species 0 X5= 0
 Column Totals: 120 (A) 363 (B)
 Prevalence Index = B/A= 3.03

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100% (A/B)

Project Veg Type: DEST-HJDWet Code: 5ENWI Code: 2

Hydrophytic Vegetation Indicators

Y Dominance Test is >50%N Prevalence Index is ≤3.0N Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Pbt size 15x15 to not include alders.

Shrub = 105, 52.5, 21.0 Herb = 15, 7.5, 3.0

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N

Depth of Surface Water: _____

Water Table Present? Y NDepth to Water Table: 15"Just seeping in at this level, not yet filled to this level? (check if yes) ☒Restrictive Layer w/in 24"? Y N

If Y, depth to Layer _____

Restrictive Layer Type _____

If lateral flow, at what depth? _____

Saturated Soil Present? Y NDepth to saturation 12"

Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 1 (total)

N Surface Water (A1)
N High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 1 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
Y Geomorphic Position (D2)
N Shallow Aquitard (D3) (# frost)
N Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments: Recent heavy rains. - Check precip.Aspect: E (cardinal) Slope: 3 %HGM Class: N/A Landform: SwaleLocal relief: concave / convex / noneMacrotopo (in poly): Shrub cover Microtopo: Hum - largeAre climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y N

Soils

PLOT NO: HDR 5149-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: SPD

Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-4	Oi	—	—	—									
4-5	C	10YR 6/2	—	VFSA LO									Ash
5-8	Oeb	—	—	—									
8-10	A _b	10YR 3/2	100	FSALO									
10-13	B	2.5Y 4/2	90	SALO									
		5Y 4/4	10	SALO								Neg	
13-22	B	2.5Y 4/3	100	SALO								Neg	Inclusion - no + redox

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematicOther Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α-α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: No hydric soil indicators.

Other Soil Observations:

Major Rooting Zone: 12 in.

Cryoturbated? Y ☒ NThixotropic? Y ☒ N

Hydric Soils?

Y ☒ N

Wetland Determination

- Hydrophytic Vegetation Present? ☒ Yes ☒ No $PI > 3.0$
 Wetland Hydrology Present? ☒ Yes ☒ No
 Hydric Soils Present? ☒ Yes ☒ No
 Plot Meets Wetland Criteria? Yes Yes-Transitional ☒ No No-Transitional

Remarks: Passes Dominance Test but PI is > 3.0, No OBL or FACW species present. Recent heavy rainfall could account for saturation.

Archer #	Photo #	Subject	Bearing
Ricoh #	750	Soil	—
(4 veg photos in each direction, if different;	751	Soil	—
2 soil photos; soil	752	Veg	N
Profile and above pit)	753	↓	E
	754	↓	S
	755	↓	W



Plot Number: HDR5149_17 **Description:** Vegetation **Date:** 8/31/2017



Plot Number: HDR5149_17 **Description:** Vegetation **Date:** 8/31/2017



Plot Number: HDR5149_17 Description: Soil Date: 8/31/2017



Plot Number: HDR5149_17 Description: Soil Date: 8/31/2017

Archer Lat: N 59. 35787 GPS datum: NAD83
Archer Long: W 154. 60445

Wetland Determination Form

PLOT: HDR 5155-17
Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
Investigator: 1) Wigren 2) Halstead 3) _____
Bear Guard: Trefon, G. Observer: _____
Do 'Normal Circumstances' Exist? YES NO
Is the Site Significantly Disturbed (Atypical Situation)? YES NO
(Indicators altered due to human acts or natural events) Veg Soil Hydro
Is the Area a Potential Problem Area? YES NO
(Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/31/2017
County: Lake & Peninsula Borough/Kenai Borough
State: Alaska Subregion: Western/Interior
Field Map: 19 map date: 8/25/17
Township: 9S Range: 32W
Section: 36 S.M. Quad No.: TLR B-5
General Location (opt): _____
Site marked on map? Y

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
① <u>Ah vir</u>	<u>S</u>	<u>FAC</u>	<u>40</u>			⑬ <u>Eg syl</u>	<u>H</u>	<u>FAC</u>	<u>8</u>		
② <u>Sal bar</u>	<u>S</u>	<u>FAC</u>	<u>35</u>			⑭ <u>Cha ang</u>		<u>FACU</u>	<u>10</u>		
3. <u>Spi bea</u>	<u>S</u>	<u>FACU</u>	<u>5</u>			⑮ <u>Cal can</u>		<u>FAC</u>	<u>20</u>		
4. <u>Rub spe</u>	<u>S</u>	<u>FACU</u>	<u>5</u>			16. <u>Cor sui</u>		<u>FAC</u>	<u>3</u>		
5. <u>Sal ala</u>	<u>S</u>	<u>FAC</u>	<u>10</u>			17. <u>Ath fil</u>		<u>FAC</u>	<u>5</u>		
6. <u>Rub arc</u>	<u>S</u>	<u>FAC</u>	<u>3</u>			18. <u>Pur gra</u>		<u>FAC</u>	<u>T</u>		
7. <u>Rib hvd</u>	<u>S</u>	<u>FACU</u>	<u>3</u>			19. <u>San can</u>		<u>FACW</u>	<u>3</u>		
8. <u>Car mic</u>	<u>H</u>	<u>FAC</u>	<u>3</u>			20. <u>Gal bar</u>		<u>FAC</u>	<u>T</u>		
9. <u>Rib</u>			<u>T</u>			21. <u>Her max</u>	<u>↓</u>	<u>FACU</u>	<u>7</u>		
10. <u>Aco del</u>	<u>H</u>	<u>FAC</u>	<u>T</u>			22. lichen					
11. <u>The phe</u>	<u>H</u>	<u>NL</u>	<u>3</u>			23. moss (feather / sphagnum)					
12. <u>Ang luc</u>	<u>H</u>	<u>FACU</u>	<u>5</u>			24. bare ground					

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species <u>0</u>	X1= <u>0</u>
FACW species <u>3</u>	X2= <u>6</u>
FAC species <u>130</u>	X3= <u>390</u>
FACU species <u>32</u>	X4= <u>128</u>
UPL + NL species <u>3</u>	X5= <u>15</u>
Column Totals: <u>168</u> (A)	<u>539</u> (B)
Prevalence Index = B/A= <u>3.21</u>	

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 80% (A/B)

Project Veg Type: CAWTS
JDWet Code: U
ENWI Code: U
Hydrophytic Vegetation Indicators
Dominance Test is >50%
Prevalence Index is ≤3.0
Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
(Y) N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments: Dense alder/willow thicket.

Shrub = 101, 50.5, 20.2 Herb = 67, 33.5, 13.4

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y (N)
Depth of Surface Water: _____
Water Table Present? (Y) N
Depth to Water Table: 12 "
Just seeping in at this level, not yet filled to this level? (check if yes) ☐
Restrictive Layer w/in 24"? Y (N)
If Y, depth to Layer _____
Restrictive Layer Type _____
If lateral flow, at what depth? _____
Saturated Soil Present? (Y) N
Depth to saturation 10 "
Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 2 (total)

N Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments: High rain fall recently. No H₂S.

Aspect: S (cardinal) Slope: 2-3 % Local relief: concave / convex / none
HGM Class: N/A Landform: Backslope Macrotopo (in poly): convex Microtopo: None
Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?
(Y) N

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: MWD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-3	Oe												
3-4	C	10YR 6/2	100	VE-SALO								neg	
4-6	A1	7.5YR 3/2	100	SILC								neg	
6-19	B/C	10YR 3/3	100	SILC								neg	30% cobbles

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ Histosol or Histel (A1)
- ☒ Histic Epipedon (A2)
- ☒ Hydrogen Sulfide (A4)
- ☒ Thick Dark Surface (A12)
- ☒ Alaska Gleyed (A13)
- ☒ Alaska Redox (A14)
- ☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
- ☒ Alaska Alpine Swales (TA5)
- ☒ Alaska Redox with 2.5Y Hue (4a3)
- ☒ Alaska Gleyed w/out Hue 5Y or Redder Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
- ☒ Soils with Low Weatherable Iron Content (4b2)
- ☒ Soil pH Greater than 7.2 (4b3)
- ☒ Recently Developed Wetland (4b4)
- ☒ Positive α,α Test (60% of 4" layer) (4c)
- ☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: No hydric soil indicators. Water likely drains away quickly due to slope and permeability.

Other Soil Observations:

Major Rooting Zone: 10 in.

Cryoturbated? Y ☒

Thixotropic? Y ☒

Hydric Soils?

Y ☒

Wetland Determination

- Hydrophytic Vegetation Present? ☒ Yes ☐ No PI > 3.0
- Wetland Hydrology Present? ☒ Yes ☐ No
- Hydric Soils Present? ☒ Yes ☐ No
- Plot Meets Wetland Criteria? Yes Yes-Transitional ☒ No No-Transitional

Remarks: Backslope CAWTS above alpine pond. Stream from 5154 can be heard pouring into the waterbody below. Plot located on the rim of wetland fen that is currently flooded. Slope becomes much steeper ~30-40' from pit. High recent rainfall. Due to slope and permeable soils, it is likely that water does not saturate the soils for extended periods.

Archer #	Photo #	Subject	Bearing
Ricoh #	771	Soil	-
(4 veg photos in each direction, if different;	772	Soil	-
2 soil photos: soil	773	Veg	N
Profile and above pit)	774		E
	775		S
	776		W



Plot Number: HDR5155_17 **Description:** Vegetation **Date:** 8/31/2017



Plot Number: HDR5155_17 **Description:** Vegetation **Date:** 8/31/2017



Plot Number: HDR5155_17 Description: Soil Date: 8/31/2017



Plot Number: HDR5155_17 Description: Soil Date: 8/31/2017

Archer Lat: N 59. 35917 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5157-17Archer Long: W 154. 62173Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halstead 2) Wigren 3) _____
 Bear Guard: Trefon, G. Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/31/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 19 map date: 8/25/17
 Township: 9S Range: 32W
 Section: 35 S.M. Quad No.: 7418-5
 General Location (opt): _____
 Site marked on map? X

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>DA/In. Vir.</u>	<u>S</u>	<u>FAC</u>	<u>75</u>	<u>>5</u>	<u>4</u>	13. <u>Att. fel.</u>	<u>H</u>	<u>FAC</u>	<u>10</u>		
2. <u>Rub. spe.</u>	<u>↓</u>	<u>FACU</u>	<u>15</u>			14. <u>The. phe.</u>	<u>↓</u>	<u>NL</u>	<u>10</u>		
3. <u>Men. fer.</u>	<u>↓</u>	<u>FACU</u>	<u>5</u>			15. <u>Cal. can.</u>	<u>↓</u>	<u>FAC</u>	<u>10</u>		
4.						16. <u>Cor. sue.</u>	<u>↓</u>	<u>FAC</u>	<u>3</u>		
5.						17. <u>Ver. vir. (hellbore)</u>	<u>↓</u>	<u>FAC</u>	<u>T</u>		
6.						18. <u>Str. amp.</u>	<u>↓</u>	<u>FACU</u>	<u>T</u>		
7.						19.					
8.						20.					
9.						21.					
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by:
 OBL species 0 X1= 0
 FACW species 0 X2= 0
 FAC species 98 X3= 294
 FACU species 20 X4= 80
 UPL + NL species 10 X5= 50
 Column Totals: 128 (A) 424 (B)
 Prevalence Index = B/A= 3.31

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 75% (A/B)

Project Veg Type: CATSJDWet Code: TENWI Code: 25

Hydrophytic Vegetation Indicators

Y Dominance Test is >50%N Prevalence Index is ≤3.0N Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematicVegetation Comments: PI is >3.0 but passes Dominance Test.Shrub = 95, 47.5, 19 Herb = 33, 16.5, 6.6

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N
 Depth of Surface Water: _____
 Water Table Present? Y N
 Depth to Water Table: _____
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y N
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y N
 Depth to saturation _____
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
N High Water Table (A2)
N Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B5)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: S (cardinal) Slope: 10 %
 HGM Class: NA Landform: Swale Local relief concave / convex / none
 Macrotopo (in poly): flat Microtopo: flat
 Are climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y N

Soils

PLOT NO: HDR 5757-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-2	Oi												
2-4	C	10YR 4/2		VSALD									Ash
4-6	Oeb												
6-8	B	10YR 4/4	100	FSALD									
8-11	A	10YR 3/2	100	SILD									
11-22	B	7.5YR 3/3	100	SILD									

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α₁α₂ Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

Profile dry throughout.

Other Soil Observations:Major Rooting Zone: 18 in.Cryoturbated? Y ☒Thixotropic? Y ☒**Hydric Soils?**Y ☒**Wetland Determination**Hydrophytic Vegetation Present? ☒ Yes ☐ NoWetland Hydrology Present? ☒ Yes ☐ NoHydric Soils Present? ☒ Yes ☐ NoPlot Meets Wetland Criteria? Yes Yes-Transitional ☒ No No-Transitional**Remarks:**

PI > 3.0

Archer #	Photo #	Subject	Bearing
Ricoh #	781	Soil	-
(4 veg photos in each direction, if different;	782	Soil	-
2 soil photos: soil	783	Veg	N
Profile and above pit)	784	↓	E
	785	↓	S
	786	↓	W



Plot Number: HDR5157_17 **Description:** Vegetation **Date:** 8/31/2017



Plot Number: HDR5157_17 **Description:** Vegetation **Date:** 8/31/2017



Plot Number: HDR5157_17 Description: Soil Date: 8/31/2017



Plot Number: HDR5157_17 Description: Soil Date: 8/31/2017

Archer Lat: N 59. 42878 GPS datum: NAD83
Archer Long: W 154. 90373

Wetland Determination Form

PLOT: HDR 5172-17
Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
Investigator: 1) Wigren 2) Halstead 3) _____
Bear Guard: G. Trefon Observer: J. Nowatak
Do 'Normal Circumstances' Exist? YES NO
Is the Site Significantly Disturbed (Atypical Situation)? YES NO
(Indicators altered due to human acts or natural events) Veg Soil Hydro
Is the Area a Potential Problem Area? YES NO
(Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/1/2017
County: Lake & Peninsula Borough/Kenai Borough
State: Alaska Subregion: Western/Interior
Field Map: 2 map date: 8/25/17
Township: 9S Range: 33W
Section: 6 S.M. Quad No.: JLT B-6
General Location (opt): _____
Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Aln vir</u>	<u>S</u>	<u>FAC</u>	<u>80</u>			13. <u>Cal can</u>	<u>H</u>	<u>FAC</u>	<u>40</u>		
2. <u>Rob spe</u>	<u>S</u>	<u>FACU</u>	<u>10</u>			14. <u>Dry exp</u>	<u>H</u>	<u>FAC</u>	<u>55</u>		
3.						15. <u>Cor sue</u>	<u>H</u>	<u>FAC</u>	<u>70</u>		
4.						16.					
5.						17.					
6.						18.					
7.						19.					
8.						20.					
9.						21.					
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by: _____
OBL species 0 X1= 0
FACW species 0 X2= 0
FAC species 185 X3= 555
FACU species 10 X4= 40
UPL + NL species 0 X5= 0
Column Totals: 195 (A) 595 (B)
Prevalence Index = B/A= 3.05

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 100% (A/B)

Project Veg Type: CATS
JDWet Code: N
ENWI Code: N
Hydrophytic Vegetation Indicators
Y Dominance Test is >50%
N Prevalence Index is ≤3.0
N Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
Y N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments: Dominated by FAC vegetation.

Shrub = 90, 45, 18 Herb = 105, 52.5, 21.0

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N
Depth of Surface Water: _____
Water Table Present? Y N
Depth to Water Table: _____
Just seeping in at this level, not yet filled to this level? (check if yes) ☐
Restrictive Layer w/in 24"? Y N
If Y, depth to Layer _____
Restrictive Layer Type _____
If lateral flow, at what depth? _____
Saturated Soil Present? Y N
Depth to saturation _____
Epi Endo Unknown (circle type of sat.) _____

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
N High Water Table (A2)
N Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B5)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments: No wetland hydrology indicators.

Aspect: N (cardinal) Slope: 3 % Local relief: concave / convex / none
HGM Class: N/A Landform: Backslope Macrotopo (in poly): convex Microtopo: sm-Hum
Are climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Wetland Hydrology?
Y N

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-2	Oi												
2-4	Oe												
4-13	A	7.5YR 3/1	100	SILT									
13-20	A/B	7.5YR 2.5/2	100	GRALO									

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)
Primary Indicators

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α,α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: Dry soils. No hydric soil indicators

Other Soil Observations:

 Major Rooting Zone: 14 in.

 Cryoturbated? Y ☒

 Thixotropic? Y ☒
Hydric Soils?

 Y ☒
Wetland Determination

Hydrophytic Vegetation Present? ☒ Yes ☐ No PI = 3.05 but passes Dominance Test
 Wetland Hydrology Present? ☒ Yes ☐ No
 Hydric Soils Present? ☒ Yes ☐ No
 Plot Meets Wetland Criteria? Yes Yes-Transitional ☒ No No-Transitional

Remarks: Closed alder thicket on slope. Adjacent to ODBESB in site 5171, slightly higher (~3') in elevation and convex surface shape. Wet OWTS on fringe.

Archer #	Photo #	Subject	Bearing
Ricoh #	850	Soil	-
(4 veg photos in each direction, if different;	851	Soil	-
2 soil photos: soil	852	Veg	N
Profile and above pit)	853	↓	E
	854	↓	S
	855	↓	W



Plot Number: HDR5172_17 **Description:** Vegetation **Date:** 9/1/2017



Plot Number: HDR5172_17 **Description:** Vegetation **Date:** 9/1/2017



Plot Number: HDR5172_17 Description: Soil Date: 9/1/2017



Plot Number: HDR5172_17 Description: Soil Date: 9/1/2017

Archer Lat: N 59. 41567 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5182-17Archer Long: W 154. 82410Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Wigren 2) Halstead 3) _____
 Bear Guard: G. Trefon Observer: J. Nowatah
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/2/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 4 map date: 8/25/17
 Township: 9S Range: 33W
 Section: 10 S.M. Quad No.: 741-B-5
 General Location (opt): _____
 Site marked on map? Y

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
① Rho torn	S	FAC	15			③ Cal can	H	FAC	10		
2. Vac vli		FAC	10			④ Car big		FAC	10		
③ Bet man		FAC	20			15. Art arc		NL	T		
④ Emp nig		FAC	30			16. Car mic		FAC	3		
5. Sal arc		FACU	10			17. Arc alp		FAC	7		
6. Vac vit		FAC	5			18. Cha ang		FACU	3		
7. Spi bea		FACU	5			19. Rub cha		FAC	5		
8. Sal pul		FAC	5			20.					
9. Sal ala		FAC	5			21.					
10.						22. lichen			15		
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by: _____
 OBL species 0 X1= 0
 FACW species 0 X2= 0
 FAC species 125 X3= 375
 FACU species 18 X4= 72
 UPL + NL species 0 X5= 0
 Column Totals: 143 (A) 447 (B)
 Prevalence Index = B/A = 3.12

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: DEST-H
 JDWet Code: V
 ENWI Code: U
 Hydrophytic Vegetation Indicators
Y Dominance Test is >50%
N Prevalence Index is ≤3.0
N Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematicVegetation Comments: DEST-HS=105/52.5/2138/19/7.6

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N
 Depth of Surface Water: _____
 Water Table Present? Y N
 Depth to Water Table: _____
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y N
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y N
 Depth to saturation _____
 Epi Endo Unknown (circle type of sat.) _____

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 6 (total)

N Surface Water (A1)
N High Water Table (A2)
N Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (# frost)
Y Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments: Not wetland hydrology indicators observedAspect: E (cardinal) Slope: 3-4%HGM Class: N/A Landform: TerraceLocal relief: concave convex noneMacrotopo (in poly): Convex Microtopo: Hum-lowAre climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y N

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: MWD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-1	Oi												
1-2	C	10 YR 6/2	100	VFSALO									Ash
2-3	A	10 YR 2/2	100	SALO									
3-6	A/B	7.5 YR 3/3	100	SALO									
6-7	B	10 YR 3/1	100	SALO									
7-9	B	10 YR 3/3	100	SALO									
9-20	B/C	7.5 YR 3/3	100	GRALO									

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ Histosol or Histel (A1)
- ☒ Histic Epipedon (A2)
- ☒ Hydrogen Sulfide (A4)
- ☒ Thick Dark Surface (A12)
- ☒ Alaska Gleyed (A13)
- ☒ Alaska Redox (A14)
- ☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
- ☒ Alaska Alpine Swales (TA5)
- ☒ Alaska Redox with 2.5Y Hue (4a3)
- ☒ Alaska Gleyed w/out Hue 5Y or Redder Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
- ☒ Soils with Low Weatherable Iron Content (4b2)
- ☒ Soil pH Greater than 7.2 (4b3)
- ☒ Recently Developed Wetland (4b4)
- ☒ Positive α₁α Test (60% of 4" layer) (4c)
- ☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: No hydric soil indicators.

Other Soil Observations:

Major Rooting Zone: 14 in.

Cryoturbated? Y ☒ N

Thixotropic? Y ☒ N

Hydric Soils?

Y ☒ N

Wetland Determination

Hydrophytic Vegetation Present?

☒ Yes ☐ No

Wetland Hydrology Present?

☒ Yes ☐ No

Hydric Soils Present?

☒ Yes ☐ No

Plot Meets Wetland Criteria?

Yes Yes-Transitional ☒ No No-Transitional

Remarks:

DEST w/ med to large hummocks. Rocky/gravelly soils. Dominated by FAC vegetation.

↓
closer to SSMWM

Archer #	Photo #	Subject	Bearing
Ricoh #	897	Soil	-
(4 veg photos in each direction, if different;	898	Soil	-
2 soil photos: soil	900	Veg	N
Profile and above pit)	901	↓	E
	902	↓	S
			W



Plot Number: HDR5182_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR5182_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR5182_17 Description: Soil Date: 9/2/2017



Plot Number: HDR5182_17 Description: Soil Date: 9/2/2017

Archer Lat: N 59.41037 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5187-17

Archer Long: W 154.78880

Wetland? ☒ Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Halstead 2) Wozniak 3) _____
 Bear Guard: G. Trefan Observer: J. Mountain
 Do 'Normal Circumstances' Exist? ☒ YES ☐ NO
 Is the Site Significantly Disturbed (Atypical Situation)? ☒ YES ☐ NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? ☒ YES ☐ NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/2/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 4 map date: _____
 Township: 95 Range: 33W
 Section: 11 S.M. Quad No.: 142 B-5
 General Location (opt): _____
 Site marked on map? ☒ Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
① Sal. pul.	S	FAC	45	>5		⑬ Cal. can.	H	FAC	50		
② Sal. ala.		FAC	15	>5		14. Pot. pul.		OBL	5		
③ Spi. beau. (Spi. sta.)		FACU	15			15. Equi. ar.		FAC	10		
4. Ala. vir.		FAC	5			16. Vio. sp.		-	T		
⑤ Sal. bar.		FAC	15	>5		17. Cor. sue.		FAC	T		
6. Bet. pop.		FACU	T			18.					
7.						19.					
8.						20.					
9.						21.					
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by: _____
 OBL species 5 X1= 5
 FACW species 0 X2= 0
 FAC species 140 X3= 420
 FACU species 15 X4= 60
 UPL + NL species 0 X5= 0
 Column Totals: 160 (A) 485 (B)
 Prevalence Index = B/A= 3.03

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 80 (A/B)

Project Veg Type: CWTSJDWet Code: WENWI Code: P31B

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%☒ Prevalence Index is ≤3.0☒ Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

☒ Y ☐ N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S=95/47.5/19

H=65/32.5/13

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y ☒ N
 Depth of Surface Water: _____
 Water Table Present? Y ☐ N
 Depth to Water Table: 10"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☒
 Restrictive Layer w/in 24"? Y ☒ N
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? ☒ Y ☐ N
 Depth to saturation 6"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 3 (total)

☐ Surface Water (A1)
☒ High Water Table (A2)
☒ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Marl Deposits (B15)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☒ Hydrogen Sulfide Odor (C1)
☐ Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
☐ Other (explain in Hydrology Comments)

Secondary Indicators 2 (total)

☐ Water-Stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospheres on Living Roots (C3)
☒ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3) (# frost)
☐ Micro-topographic Relief (D4)
☐ FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: E (cardinal) Slope: 4 % Local relief: concave / convex / none
 HGM Class: Slope Landform: Bench Macrotopo (in poly): Flat Microtopo: Flat
 Are climatic/hydrologic conditions at the site typical for this time of year? ☒ Y ☐ N Unknown (Explain if N or Unknown)

Wetland Hydrology?

☒ Y ☐ N

Soils

PLOT NO: HDR 5187.17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: SPD

Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-9	Oi												
9-10	Oe												
10-13	A	10YR 2/2	100	SILTY									
13-21	B	5Y 5/2	90	FSPLO								+	10% Organic streaking

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4) -10"
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α_q Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

8+ organics observed.

Other Soil Observations:

Major Rooting Zone: 10 in.

Cryoturbated? Y ☒Thixotropic? Y ☒**Hydric Soils?**☒ N**Wetland Determination**

Hydrophytic Vegetation Present?

☒ Yes ☐ No

Wetland Hydrology Present?

☒ Yes ☐ No

Hydric Soils Present?

☒ Yes ☐ No

Plot Meets Wetland Criteria?

☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional**Remarks:**

Sloped bench above creek.

Archer #	Photo #	Subject	Bearing
Ricoh #	918	Soil	
(4 veg photos in each direction, # different;	919	↓	
2 soil photos: soil	920	N	
Profile and above pit)	921	E	
	922	S	
	923	W	



Plot Number: HDR5187_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR5187_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR5187_17 Description: Soil Date: 9/2/2017



Plot Number: HDR5187_17 Description: Soil Date: 9/2/2017

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Wigren 2) Halstead
 Bear Guard: Trafong Observer: Novata LJ
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/2/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 5 map date: 8/25/17
 Township: 95 Range: 33W
 Section: 11 S.M. Quad No.:
 General Location (opt):
 Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snaos	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Bet pap</u>	<u>T</u>	<u>FACU</u>	<u>30</u>	<u>>10'</u>	<u>8"</u>	13. <u>Dry exp</u>	<u>H</u>	<u>FACU</u>	<u>20</u>		
2.						14. <u>Cal can</u>		<u>FAC</u>	<u>30</u>		
3. <u>Bet pap</u>	<u>S</u>	<u>FACU</u>	<u>15</u>	<u><10'</u>	<u><3"</u>	15. <u>Gym dry</u>		<u>FACU</u>	<u>10</u>		
4. <u>Sal pul</u>		<u>FAC</u>	<u>5</u>	<u><8'</u>		16. <u>Egu ar</u>		<u>FAC</u>	<u>20</u>		
5. <u>Vib edv</u>		<u>FACU</u>	<u>10</u>			17. <u>Cor sui</u>		<u>FAC</u>	<u>10</u>		
6. <u>Spi bea</u>		<u>FACU</u>	<u>10</u>			18. <u>Str amp</u>		<u>FACU</u>	<u>7</u>		
7. <u>Vac vit</u>	<u>↓</u>	<u>FAC</u>	<u>5</u>			19. <u>Cha ang</u>		<u>FACU</u>	<u>5</u>		
8.						20. <u>Car mic</u>		<u>FAC</u>	<u>3</u>		
9.						21. <u>Ang luc</u>	<u>↓</u>	<u>FACU</u>	<u>3</u>		
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:
 Total % Cover of Multiply by:
 OBL species 0 X1= 0
 FACW species 0 X2= 0
 FAC species 73 X3= 219
 FACU species 110 X4= 440
 UPL + NL species 0 X5= 0
 Column Totals: 183 (A) 659 (B)
 Prevalence Index = B/A= 3.60

Dominance Test Worksheet:
 Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)
 Total Number of Dominant Species Across All Strata: 7 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 42.3 (A/B)

Project Veg Type: DBF
 JDWet Code: U
 ENWI Code: U
 Hydrophytic Vegetation Indicators
N Dominance Test is >50%
N Prevalence Index is ≤3.0
 Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
 Y N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments: San can-T
4-wheeler trail through polygon. T=30/15/6 S=45/22.5/9 H=108/54/21.6

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N
 Depth of Surface Water: _____
 Water Table Present? Y N
 Depth to Water Table: _____
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y N
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y N
 Depth to saturation _____
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
N High Water Table (A2)
N Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizopheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (# frost)
N Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments: No wetland hydrology indicators.

Aspect: S (cardinal) Slope: 3 % Local relief: concave convex none
 HGM Class: N/A Landform: Backslope Macrotopo (in poly): convex Microtopo: None
 Are climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Wetland Hydrology?
 Y N

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.													
Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-3	O ₁												
3-4	C	10YR 6/1	100	VFSAL									Ash
4-8	A/B	7.5YR 2.5/3	100	FSAL									
8-16	B	10YR 4/3	100	CSLLO									
16-20	B/C	10YR 4/1	50	SILLO									
		10YR 4/3	50	SILLO									

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)		
Primary Indicators	Indicators for Problematic Hydric Soils³	Other Hydric Soil Situations (see pg 88-91)³
<input checked="" type="checkbox"/> Histosol or Histel (A1)	<input checked="" type="checkbox"/> Alaska Color Change (TA4)	<input checked="" type="checkbox"/> Soils with Low Organic Carbon Content (4b1)
<input checked="" type="checkbox"/> Histic Epipedon (A2)	<input checked="" type="checkbox"/> Alaska Alpine Swales (TA5)	<input checked="" type="checkbox"/> Soils with Low Weatherable Iron Content (4b2)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input checked="" type="checkbox"/> Alaska Redox with 2.5Y Hue (4a3)	<input checked="" type="checkbox"/> Soil pH Greater than 7.2 (4b3)
<input checked="" type="checkbox"/> Thick Dark Surface (A12)	<input checked="" type="checkbox"/> Alaska Gleyed w/out Hue 5Y or Redder	<input checked="" type="checkbox"/> Recently Developed Wetland (4b4)
<input checked="" type="checkbox"/> Alaska Gleyed (A13)	<input checked="" type="checkbox"/> Underlying layer (4a4)	<input checked="" type="checkbox"/> Positive α _s Test (60% of 4" layer) (4c)
<input checked="" type="checkbox"/> Alaska Redox (A14)		<input checked="" type="checkbox"/> Soil determined to be ponded, flooded, H ₂ O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)
<input checked="" type="checkbox"/> Alaska Gleyed Pores (A15)		

Soil Comments: Dry soils. No hydric soil indicators

Other Soil Observations:	Hydric Soils?
Major Rooting Zone: <u>15</u> in. Cryoturbated? Y <input checked="" type="checkbox"/> Thixotropic? Y <input checked="" type="checkbox"/>	Y <input checked="" type="checkbox"/>

Wetland Determination

Hydrophytic Vegetation Present? Yes ☒ No ☒
Wetland Hydrology Present? Yes ☒ No ☒
Hydric Soils Present? Yes ☒ No ☒
Plot Meets Wetland Criteria? Yes Yes-Transitional ☒ No-Transitional ☒
Remarks: Backslope above bench that is adjacent to creek.
4-wheeler trail runs through polygon.

Archer #	Photo #	Subject	Bearing
	928	Soil	-
Ricoh #	929	Soil	-
(4 veg photos in each direction, if different;	930	Veg	N
2 soil photos: soil	931	↓	E
Profile and above pit)	932	↓	S
	933	↓	W



Plot Number: HDR5189_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR5189_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR5189_17 Description: Soil Date: 9/2/2017



Plot Number: HDR5189_17 Description: Soil Date: 9/2/2017

Archer Lat: N 59. 41409 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5195-17Archer Long: W 154. 79359Wetland? (Y) Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Wigren 2) Halstead 3)
 Bear Guard: Trefon, G. Observer: Nowata, J.
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/2/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 7 map date: 8/25/17
 Township: 9S Range: 33W
 Section: 11 S.M. Quad No.: 141 B-5
 General Location (opt):
 Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. Myr gal	S	OBL	75			13. Rum arc	H	FAC	7		
2. Bet nan		FAC	20			14. Tri alp		OBL	10		
3. Pic ala		FACU	7			15. Eri sch		OBL	10		
4. Sal bar		FAC	10			16. Cor sub		FAC	5		
5. Pot fru		FAC	8			17. Equ pra		FAC	10		
6. Emp nig		FAC	5			18. Cal can		FAC	10		
7. Com pal		OBL	7			19.					
8. Bet pap		FACU	3			20.					
9. Sal pul		FAC	5			21.					
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of Multiply by:
 OBL species 102 X1= 102
 FACW species 0 X2= 0
 FAC species 80 X3= 240
 FACU species 3 X4= 12
 UPL + NL species 0 X5= 0
 Column Totals: 185 (A) 354 (B)
 Prevalence Index = B/A= 1.91

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: 086B
 JDWet Code: W
 ENWI Code: P551B
 Hydrophytic Vegetation Indicators
Y Dominance Test is >50%
Y Prevalence Index is ≤3.0
N Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
(Y) N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Less Myr gal ~ 50' downslope then transitions to DEST. use contours to define boundary. ssww ten above this plot.

Hydrology

Observations (Measured from ground surface):

Surface Water Present? (Y) N in low areas
 Depth of Surface Water: 0"
 Water Table Present? (Y) N
 Depth to Water Table: 7"
 Just seeping in at this level, not yet filled to this level? (check if yes) (X)
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____"
 Restrictive Layer Type _____"
 If lateral flow, at what depth? _____"
 Saturated Soil Present? (Y) N
 Depth to saturation 4"
 Epi (Endo) Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 4 (total)

Y Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
Y Hydrogen Sulfide Odor (C1) 10'
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 2 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizopheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
Y Geomorphic Position (D2)
N Shallow Aquitard (D3) (# frost)
N Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

Fair hydro indicators observed.

Aspect: E (cardinal) Slope: 2 % Local relief: concave / convex/ none
 HGM Class: Slope Landform: Toeslope Macrotopo (in poly): concave Microtopo: Hum-L
 Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?
(Y) N

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: SPD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-4	Oi												
4-10	Oe												
10-17	Oe												
17-20	B	7.5 YR 7/2	100	GRSILC									

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ Histosol or Histel (A1)
- ☒ Histic Epipedon (A2)
- ☒ Hydrogen Sulfide (A4) - 10"
- ☒ Thick Dark Surface (A12)
- ☒ Alaska Gleyed (A13)
- ☒ Alaska Redox (A14)
- ☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
- ☒ Alaska Alpine Swales (TA5)
- ☒ Alaska Redox with 2.5Y Hue (4a3)
- ☒ Alaska Gleyed w/out Hue 5Y or Redder Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
- ☒ Soils with Low Weatherable Iron Content (4b2)
- ☒ Soil pH Greater than 7.2 (4b3)
- ☒ Recently Developed Wetland (4b4)
- ☒ Positive α_a Test (60% of 4" layer) (4c)
- ☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: saturated @ 4". Histosol + H₂S odor @ 10"

Other Soil Observations:

Major Rooting Zone: 9 in.

Cryoturbated? Y ☒ N

Thixotropic? Y ☒ N

Hydric Soils?

☒ Y ☐ N

Wetland Determination

- Hydrophytic Vegetation Present? ☒ Yes ☐ No
- Wetland Hydrology Present? ☒ Yes ☐ No
- Hydric Soils Present? ☒ Yes ☐ No
- Plot Meets Wetland Criteria? ☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional

Remarks: Down slope from SSMWM fan.

Archer #	Photo #	Subject	Bearing
Ricoh #	953	Soil	-
(4 veg photos in each direction, if different;	954	Soil	-
2 soil photos: soil	955	Veg	N
Profile and above pit)	956	↓	E
	957	↓	S
	958	↓	W



Plot Number: HDR5195_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR5195_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR5195_17 Description: Soil Date: 9/2/2017



Plot Number: HDR5195_17 Description: Soil Date: 9/2/2017

Archer Lat: N 59. 41771 GPS datum: NAD83
Archer Long: W 154. 81561

Wetland Determination Form

PLOT: HDR 5208-17
Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
Investigator: 1) Wigren 2) Halstead 3) _____
Bear Guard: Trotter, G. Observer: Nowatak, J.
Do 'Normal Circumstances' Exist? YES (N) NO
Is the Site Significantly Disturbed (Atypical Situation)? YES (N) NO
(Indicators altered due to human acts or natural events) Veg Soil Hydro
Is the Area a Potential Problem Area? YES (N) NO
(Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/2/2017
County: Lake & Peninsula Borough/Kenai Borough
State: Alaska Subregion: Western/Interior
Field Map: 7 map date: 8/25/17
Township: 9S Range: 33W
Section: 10 S.M. Quad No.: 142 B-5
General Location (opt): _____
Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. Bet pap	T	FACU	20	>10	>6"	13. Cal can	H	FAC	60		
2.						14. Cha ang		FACU	10		
3. Bet pap	S	FACU	15	<10	<3"	15. Gum dry		FAC	15		
4. Spi bea		FACU	10			16. San can		FACW	3		
5. Vib edu		FACU	10			17. Str amp		FACU	5		
6. Sal ala		FAC	7			18. Aco del		FAC	3		
7. Emp nig	↓	FAC	5			19. Ach mil		FACU	3		
8.						20. Cor sui		FAC	10		
9.						21. Ger eri	↓		T		
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by: _____
OBL species 0 X1= 0
FACW species 3 X2= 6
FAC species 103 X3= 309
FACU species 73 X4= 292
UPL + NL species 0 X5= 0
Column Totals: 179 (A) 607 (B)
Prevalence Index = B/A= 3.39

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 20 (A/B)

Project Veg Type: OBW
JDWet Code: U
ENWI Code: U
Hydrophytic Vegetation Indicators
N Dominance Test is >50%
N Prevalence Index is ≤3.0
— Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
Y (N)

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Dry exp - FAC-3 - Herb
Shrub = 47/23.5/9.4

Herb = 12/56/22.4 T = 20/10/4

Hydrology

Observations (Measured from gmd surface):

Surface Water Present? Y (N)
Depth of Surface Water: _____
Water Table Present? Y (N)
Depth to Water Table: _____
Just seeping in at this level, not yet filled to this level? (check if yes) ☐
Restrictive Layer w/in 24"? Y (N)
If Y, depth to Layer _____
Restrictive Layer Type _____
If lateral flow, at what depth? _____
Saturated Soil Present? Y (N)
Depth to saturation _____
Epi Endo Unknown: (circle type of sat.) _____

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
N High Water Table (A2)
N Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizopheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments: No wetland hydrology indicators.

Aspect: S (cardinal) Slope: 4 % Local relief: concave (convex) none
HGM Class: N/A Landform: Backslope Macrotopo (in poly): convex Microtopo: Hum-2
Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?
Y (N)

Soils

PLOT NO: HDR 520817

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-4	O _i												
4-6	O _e												
6-7	C	10YR 6/2	100										Ash
7-8	A	10YR 2/2	100	SILTY									
8-12	B	10YR 3/2	100	SILTY									
12-19	B/C	7.5YR 2.5/2	100	GRSILTY									Gravels/cobbles 40%

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ Histosol or Histel (A1)
- ☒ Histic Epipedon (A2)
- ☒ Hydrogen Sulfide (A4)
- ☒ Thick Dark Surface (A12)
- ☒ Alaska Gleyed (A13)
- ☒ Alaska Redox (A14)
- ☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
- ☒ Alaska Alpine Swales (TA5)
- ☒ Alaska Redox with 2.5Y Hue (4a3)
- ☒ Alaska Gleyed w/out Hue 5Y or Redder Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary Indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
- ☒ Soils with Low Weatherable Iron Content (4b2)
- ☒ Soil pH Greater than 7.2 (4b3)
- ☒ Recently Developed Wetland (4b4)
- ☒ Positive α₁ Test (60% of 4" layer) (4c)
- ☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: No hydric soil indicators. Dry pit.

Other Soil Observations:

Major Rooting Zone: 8 in.

Cryoturbated? Y ☒ N

Thixotropic? Y ☒ N

Hydric Soils?

Y ☒ N

Wetland Determination

- Hydrophytic Vegetation Present? Yes ☒ No
- Wetland Hydrology Present? Yes ☒ No
- Hydric Soils Present? Yes ☒ No
- Plot Meets Wetland Criteria? Yes Yes-Transitional ☒ No No-Transitional

Remarks: OBF on back slope

Archer #	Photo #	Subject	Bearing
Ricoh #	121-006	Soil	-
(4 veg photos in each direction, if different;	007	Soil	-
2 soil photos: soil	008	Veg	N
Profile and above pit)	009		E
	010		S
	011		W



Plot Number: HDR5208_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR5208_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR5208_17 Description: Soil Date: 9/2/2017



Plot Number: HDR5208_17 Description: Soil Date: 9/2/2017

Archer Lat: N 59. 42242 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5209-17Archer Long: W 154. 81145Wetland? ☒ Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Wigren 2) Halstead 3) _____
 Bear Guard: Trefon, G. Observer: Nowatke, J.
 Do 'Normal Circumstances' Exist? ☒ YES ☐ NO
 Is the Site Significantly Disturbed (Atypical Situation)? ☐ YES ☒ NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? ☐ YES ☒ NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/2/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 6 map date: 8/25/17
 Township: 9S Range: 33W
 Section: 3 S.M. Quad No.: 741B-5
 General Location (opt): _____
 Site marked on map? ☒ Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Rho tom</u>	<u>S</u>	<u>FAC</u>	<u>35</u>	<u><8"</u>		13. <u>Car big</u>	<u>H</u>	<u>FAC</u>	<u>20</u>		
2. <u>Bet nam</u>	<u>I</u>	<u>FAC</u>	<u>10</u>			14. <u>Car mic</u>	<u>I</u>	<u>FAC</u>	<u>15</u>		
3. <u>Emp nig</u>	<u>I</u>	<u>FAC</u>	<u>25</u>			15. <u>Car agn</u>	<u>OBL</u>	<u>3</u>			
4. <u>Vac uli</u>	<u>I</u>	<u>FAC</u>	<u>15</u>			16. <u>Arc alp</u>	<u>FAC</u>	<u>3</u>			
5. <u>Sal pul</u>	<u>I</u>	<u>FAC</u>	<u>5</u>			17. <u>Cal can</u>	<u>FAC</u>	<u>10</u>			
6. <u>Vac vit</u>	<u>I</u>	<u>FAC</u>	<u>5</u>			18. <u>Agf sca</u>	<u>FAC</u>	<u>3</u>			
7.						19. <u>Tri alp</u>	<u>OBL</u>	<u>T</u>			
8.						20.					
9.						21.					
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by: _____
 OBL species 3 X1= 3
 FACW species 0 X2= 0
 FAC species 146 X3= 438
 FACU species 0 X4= 0
 UPL + NL species 0 X5= 0
 Column Totals: 149 (A) 441 (B)
 Prevalence Index = B/A= 2.96

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: DEST-C
 JDWet Code: W
 ENWI Code: PSSB/EMIB
 Hydrophytic Vegetation Indicators
☒ Dominance Test is >50%
☒ Prevalence Index is ≤3.0
☒ Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

☒ Y ☐ N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

S=95/47.5/19H=54/27/10.8

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? ☒ Y ☐ N
 Depth of Surface Water: _____"
 Water Table Present? ☒ Y ☐ N
 Depth to Water Table: 7"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? ☒ Y ☐ N
 If Y, depth to Layer _____"
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____"
 Saturated Soil Present? ☒ Y ☐ N
 Depth to saturation 7"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 2 (total)

N Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 3 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
Y Geomorphic Position (D2)
N Shallow Aquitard (D3) (# frost)
Y Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

1° & 2° hydro indicators.

Aspect: N (cardinal) Slope: 2 %
 HGM Class: Slope Landform: Toeslope Macrotopo (in poly): Concave Microtopo: Mum-m
 Are climatic/hydrologic conditions at the site typical for this time of year? ☒ Y ☐ N Unknown (Explain if N or Unknown)

Wetland Hydrology?

☒ Y ☐ N

Soils

PLOT NO: HDR 5209 17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: SPD Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-3	Oi												
3-9	Oe												
9-17	Oe												80% cobble

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: very cobbly in lower portion. Histosol.**Other Soil Observations:**Major Rooting Zone: 8 in.Cryoturbated? Y ☒ NThixotropic? Y ☒ N**Hydric Soils?**☒ Y ☐ N**Wetland Determination**Hydrophytic Vegetation Present? ☒ Yes ☐ NoWetland Hydrology Present? ☒ Yes ☐ NoHydric Soils Present? ☒ Yes ☐ NoPlot Meets Wetland Criteria? ☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional

Remarks: Slope DEST-C above SSMWM/FSM. Use topo contours to define upland/wetland boundary.

Archer #	Photo #	Subject	Bearing
Ricoh #	121-012	Soil	-
(4 veg photos in each direction, if different;	013	Soil	-
2 soil photos: soil	014	Veg	N
Profile and above pit)	015		E
	016		S
	017		W



Plot Number: HDR5209_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR5209_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR5209_17 Description: Soil Date: 9/2/2017



Plot Number: HDR5209_17 Description: Soil Date: 9/2/2017

Archer Lat: N 59. 42166 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 5212-17Archer Long: W 154. 80795Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Wigren 2) Malstead 3) _____
 Bear Guard: treton G. Observer: Nowata, Jr
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/2/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 6 map date: 8/25/17
 Township: 9S Range: 38W
 Section: 3 S.M. Quad No.: 142 B-5
 General Location (opt): _____
 Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
① Rho tom	S	FAC	25	<8"		⑬ Cel can	H	FAC	10		
② Vac uli		FAC	20			⑭ Equ atv		FAC	10		
③ Bet nan		FAC	20			15. Tri cae		OBL	5		
4. Emp nig		FAC	10			⑯ Car big		FAC	10		
5. Sal pyl		FAC	10			17. Car agb		OBL	3		
6. Sal lrus		FACW	3			18. Tri alp		OBL	3		
7. Sal myr		FACW	3			19. Car tim		OBL	4		
8. Vac vit	↓	FAC	3			20. Rub cha	↓	FACW	3		
9. And pol	↓	FACW	3			21. Eri ang	↓	OBL	3		
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species <u>18</u>	X1= <u>18</u>
FACW species <u>12</u>	X2= <u>24</u>
FAC species <u>118</u>	X3= <u>354</u>
FACU species <u>0</u>	X4= <u>0</u>
UPL + NL species <u>0</u>	X5= <u>0</u>
Column Totals: <u>148</u> (A)	<u>396</u> (B)
Prevalence Index = B/A=	<u>2.68</u>

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 6 (A)
 Total Number of Dominant Species Across All Strata: 6 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: DEST-H
 JDWet Code: W
 ENWI Code: 353/EMIB
 Hydrophytic Vegetation Indicators
☒ Dominance Test is >50%
☒ Prevalence Index is ≤3.0
☒ Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
☒ N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments: Tri cae + Tri alp @ bottoms of hummocks.

S=97/48.5/19.4 H=51/25.5/10.2

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y ☒ N
 Depth of Surface Water: _____"
 Water Table Present? ☒ Y N
 Depth to Water Table: 12"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y ☒ N
 If Y, depth to Layer _____"
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____"
 Saturated Soil Present? ☒ Y N
 Depth to saturation 12"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 2 (total)

☒ Surface Water (A1)
☒ High Water Table (A2)
☒ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Marl Deposits (B15)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Hydrogen Sulfide Odor (C1)
☐ Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
☐ Other (explain in Hydrology Comments)

Secondary Indicators 3 (total)

☐ Water-Stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospheres on Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3) (≠ frost)
☐ Micro-topographic Relief (D4)
☐ FAC-Neutral Test (D5)

Hydrology Comments: Large hummocks. High water table and saturation.

Aspect: E (cardinal) Slope: 1-2%

HGM Class: slope Landform: Toeslope Macrotopo (in poly): concave Microtopo: Hum-Large

Are climatic/hydrologic conditions at the site typical for this time of year? ☒ Y N Unknown (Explain if N or Unknown)

Wetland Hydrology?
☒ Y N

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: SPD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-4	Oi												
4-11	Oe												
11-18	A/B	10YR 3/2	100										

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α,α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: Cobbles start @ 7" ~30% saturated just above water table.

Other Soil Observations:

Major Rooting Zone: 8 in.

Cryoturbated? Y ☒ N

Thixotropic? Y ☒ N

Hydric Soils?

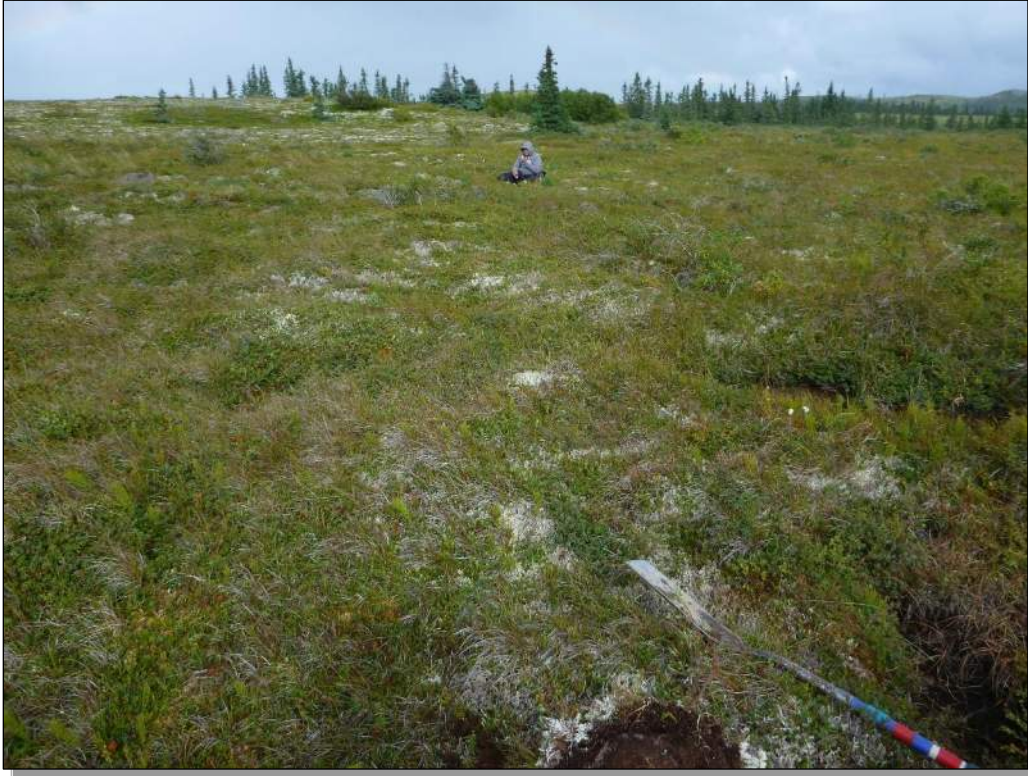
☒ Y ☐ N

Wetland Determination

- Hydrophytic Vegetation Present? ☒ Yes ☐ No
 Wetland Hydrology Present? ☒ Yes ☐ No
 Hydric Soils Present? ☒ Yes ☐ No
 Plot Meets Wetland Criteria? ☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional

Remarks: Pond below this point is very low w/ lots of partially vegetated and bare shoreline. This is the uppermost extent of wetland.

Archer #	Photo #	Subject	Bearing
Ricoh #	121-026		
(4 veg photos in each direction, if different;	027		
2 soil photos: soil	028		
Profile and above pit)	029		
	030		
	031		



Plot Number: HDR5212_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR5212_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR5212_17 Description: Soil Date: 9/2/2017



Plot Number: HDR5212_17 Description: Soil Date: 9/2/2017

Archer Lat: N 59. 33787 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6000-17Archer Long: W 154. 27055Wetland? (Y) Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Mac S. 2) Alena G. 3) _____
 Bear Guard: Nick J. Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/15/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 30 map date: 8/11/17
 Township: 10 S Range: 30 W
 Section: 1 S.M. Quad No.: Flama B-4
 General Location (opt): _____
 Site marked on map? X

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also <u>water, rock, snags</u>	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Salix arc</u>	<u>S</u>	<u>FACU</u>	<u>5</u>			13. <u>Sail rag (Rho int)</u>	<u>H</u>	<u>FAC</u>	<u>T</u>		
2. <u>Salix al</u>	<u>S</u>	<u>FAC</u>	<u>7</u>			14. <u>Pin vul</u>	<u>H</u>	<u>OBL</u>	<u>T</u>		
3. <u>Ara alp</u>	<u>S</u>	<u>FACU</u>	<u>15</u>			15. <u>Bot hybrid</u>	<u>S</u>	<u>FAC</u>	<u>T</u>		
4. <u>Emp nig</u>	<u>S</u>	<u>FAC</u>	<u>20</u>			16. <u>Cal can</u>	<u>H</u>	<u>FAC</u>	<u>5</u>		
5. <u>Rosa tosa</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			17. <u>Tri Lac</u>	<u>H</u>	<u>OBL</u>	<u>T</u>		
6. <u>Vacc uli</u>	<u>S</u>	<u>FAC</u>	<u>30</u>			18. _____					
7. <u>Vacc vit</u>	<u>S</u>	<u>FAC</u>	<u>8</u>			19. _____					
8. <u>Aln vit</u>	<u>S</u>	<u>FAC</u>	<u>4</u>			20. _____					
9. <u>Bot can</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			21. _____					
10. <u>Erigeron</u>	<u>H</u>	<u>GAL</u>	<u>T</u>			22. <u>lichen</u>			<u>5</u>		
11. <u>Car bog</u>	<u>H</u>	<u>FAC</u>	<u>35</u>			23. <u>moss (feather / sphagnum)</u>			<u>10</u>		
12. <u>Equis</u>	<u>H</u>	<u>FAC</u>	<u>T</u>			24. <u>bare ground</u>			<u>5</u>		

Prevalence Index worksheet:

Total % Cover of _____ Multiply by:
 OBL species _____ X1= _____
 FACW species _____ X2= _____
 FAC species 119 X3= 357
 FACU species 20 X4= 80
 UPL + NL species _____ X5= _____
 Column Totals: 139 (A) 437 (B)
 Prevalence Index = B/A = 3.14

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100% (A/B)
99 Shrubs 40 herbs

Project Veg Type: DEST-CJDWet Code: WENWI Code: PSS113C

Hydrophytic Vegetation Indicators

X Dominance Test is >50%— Prevalence Index is ≤3.0— Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

(Y) N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Mosses white. Bare ground is exposed
Water 58
Willow 12%
boulders

Hydrology

Observations (Measured from gmd surface):

Surface Water Present? (Y) N
 Depth of Surface Water: 5"
 Water Table Present? (Y) N
 Depth to Water Table: 12"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____"
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____"
 Saturated Soil Present? (Y) N
 Depth to saturation 5"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 4 (total)

X Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
— Water Marks (B1)
— Sediment Deposits (B2)
— Drift Deposits (B3)
— Algal Mat or Crust (B4)
— Marl Deposits (B15)
— Iron Deposits (B5)
— Surface Soil Cracks (B6)
X Inundation Visible on Aerial Imagery (B7)
— Sparsely Vegetated Concave Surface (B8)
— Hydrogen Sulfide Odor (C1)
— Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
— Other (explain in Hydrology Comments)

Secondary Indicators 3 (total)

— Water-Stained Leaves (B9)
X Drainage Patterns (B10)
X Oxidized Rhizospheres on Living Roots (C3)
— Presence of Reduced Iron (C4)
— Salt Deposits (C5)
— Stunted or Stressed Plants (D1)
— Geomorphic Position (D2)
— Shallow Aquitard (D3) (≠ frost)
— Micro-topographic Relief (D4)
X FAC-Neutral Test (D5)

Hydrology Comments: Open water in depressions between large hummocksAspect: E (cardinal) Slope: 3 %Local relief: concave / convex / noneHGM Class: slope Landform: hull side Macrotopo (in poly): slightly concave Microtopo: large hummocks

Wetland Hydrology?

Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)(Y) N

Soils

PLOT NO: HDR 6000-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: PD Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-4	Oi												
4-5	Ash	10YR 6/2		fsil									
5-11	B1	2.5Y 6/3	80	fsil	C	7.5Y 5/6	20	RC, PL					
11-11 1/2	Ash	10YR 7/1	90	fsil	C	7.5Y 5/6	10	RC, PL					
11 1/2-15	B2	10YR 3/4		sil									

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☐ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☐ Alaska Color Change (TA4)
☐ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☐ Alaska Gleyed w/out Hue 5Y or Redder
☐ Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☐ Soils with Low Organic Carbon Content (4b1)
☐ Soils with Low Weatherable Iron Content (4b2)
☐ Soil pH Greater than 7.2 (4b3)
☐ Recently Developed Wetland (4b4)
☐ Positive α , α Test (60% of 4" layer) (4c)
☐ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: 15' boulders. Negative α on B2 layer.
 Multiple indicators of hydrology and hydrophytic veg

Other Soil Observations:Major Rooting Zone: 11 in.Cryoturbated? Y NThixotropic? Y N**Hydric Soils?**Y N**Wetland Determination**Hydrophytic Vegetation Present? Yes NoWetland Hydrology Present? Yes NoHydric Soils Present? Yes NoPlot Meets Wetland Criteria? Yes Yes-Transitional No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Moscow</u>	<u>32</u>	<u>soil</u>	
(4 veg photos in each direction, if different;	<u>33</u>	<u>soil</u>	
2 soil photos: soil	<u>34</u>	<u>W</u>	<u>veg</u>
Profile and above pit)	<u>35</u>	<u>E</u>	<u>veg</u>
	<u>36</u>	<u>S</u>	<u>veg</u>
	<u>37</u>	<u>W</u>	<u>veg</u>



Plot Number: HDR6000_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR6000_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR6000_17 Description: Soil Date: 8/15/2017



Plot Number: HDR6000_17 Description: Soil Date: 8/15/2017

Archer Lat: N 59. 33640 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6011-17Archer Long: W 154. 27995Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Mac S 2) Alanna G 3) _____
 Bear Guard: Nick J. Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/15/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 30 map date: 8/11/17
 Township: 10S Range: 30W
 Section: 2 S.M. Quad No.: Iliamna B-4
 General Location (opt): _____
 Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Rub spec</u>	<u>S</u>	<u>FACU</u>	<u>50</u>			13. <u>Cor sue</u>	<u>H</u>	<u>FACU</u>	<u>T</u>		
2. <u>Ath vir</u>	<u>S</u>	<u>FACU</u>	<u>90</u>	<u>~4</u>		14. <u>Via lang</u>	<u>H</u>	<u>FACU</u>	<u>T</u>		
3. <u>Sal gla</u>	<u>S</u>	<u>FACU</u>	<u>15</u>			15. <u>Cap tri</u> ©	<u>H</u>	<u>FACU</u>	<u>T</u>		
4. <u>Tri our</u>	<u>H</u>	<u>FACU</u>	<u>3</u>			16. <u>Urt dio</u>	<u>H</u>	<u>FACU</u>	<u>T</u>		
5. <u>Aron delp</u>	<u>H</u>	<u>FACU</u>	<u>T</u>			17. <u>Ger eri</u>	<u>H</u>	<u>FACU</u>	<u>T</u>		
6. <u>Vacc uli</u>	<u>S</u>	<u>FACU</u>	<u>10</u>			18. <u>Cal can</u>	<u>H</u>	<u>FACU</u>	<u>T</u>		
7. <u>Sangu can</u>	<u>H</u>	<u>FACU</u>	<u>5</u>			19. <u>Gem plat</u> ©	<u>H</u>	<u>—</u>	<u>T</u>		
8. <u>Vacc vir</u>	<u>H</u>	<u>FACU</u>	<u>3</u>			20. <u>_____</u>					
9. <u>Ath cye</u>	<u>H</u>	<u>FACU</u>	<u>20</u>			21. <u>_____</u>					
10. <u>The phe (Phe can)</u>	<u>H</u>	<u>FACU</u>	<u>10</u>			22. lichen					
11. <u>Ath luc</u>	<u>H</u>	<u>FACU</u>	<u>T</u>			23. moss (feather / sphagnum)					
12. <u>Cal can</u>	<u>H</u>	<u>FACU</u>	<u>5</u>			24. bare ground					

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species <u>—</u>	X1= <u>—</u>
FACW species <u>5</u>	X2= <u>10</u>
FAC species <u>143</u>	X3= <u>429</u>
FACU species <u>63</u>	X4= <u>252</u>
UPL + NL species <u>—</u>	X5= <u>—</u>
Column Totals: <u>211</u> (A)	<u>691</u> (B)
Prevalence Index = B/A= <u>3.27</u>	

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 50 (A/B)
≤ 165 H 46

Project Veg Type: CALS
 JDWet Code: U
 ENWI Code: U
 Hydrophytic Vegetation Indicators
 Dominance Test is >50%
 Prevalence Index is ≤3.0
 Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y (N)

Vegetation Comments:

Gentiana platyptera not included in AF calcs.
CALS not on project veg type sheet * Need to add

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y (N)
 Depth of Surface Water: _____
 Water Table Present? Y (N)
 Depth to Water Table: _____
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y (N)
 Depth to saturation _____
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
N High Water Table (A2)
N Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B15)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
— Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments:

closed alder steep fringe around pond.
stream flowing through alder directly to the east

Aspect: S (cardinal) Slope: 17 %Local relief: concave / convex / noneHGM Class: — Landform: hillslope Macrotopo (in poly): convex Microtopo: hummockyAre climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y (N)

Soils

PLOT NO: HDR 6001-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: MWD Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-2	Oe												
2-3	Ah	10YR 7/1		fsi									negative d/d on 10YR 7/1, 2-3
3-4	A	10YR 5/6		fsi									
4-6	Oab												
6-10	B1	2.5YR 3/4		sil									inclusions of 10YR 4/4 f sand
10-16	B2	2.5YR 2.5/2		sil									

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: Moist 3-16. No saturation to 16
 Large boulder on one side of pit

Other Soil Observations:Major Rooting Zone: 4 in.Cryoturbated? Y ☒Thixotropic? Y ☒**Hydric Soils?**Y ☒**Wetland Determination**Hydrophytic Vegetation Present? Yes ☒ NoWetland Hydrology Present? Yes ☒ NoHydric Soils Present? Yes ☒ NoPlot Meets Wetland Criteria? Yes Yes-Transitional ☒ No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Mosambi</u>	<u>83</u>	<u>soil</u>	<u>-</u>
(4 veg photos in each direction, if different;	<u>84</u>	<u>soil</u>	<u>-</u>
2 soil photos: soil	<u>85</u>	<u>veg</u>	<u>N</u>
Profile and above pit)	<u>86</u>	<u>veg</u>	<u>E</u>
	<u>87</u>	<u>veg</u>	<u>S</u>
	<u>88</u>	<u>veg</u>	<u>W</u>



Plot Number: HDR6011_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR6011_17 **Description:** Vegetation **Date:** 8/15/2017



Plot Number: HDR6011_17 **Description:** Soil **Date:** 8/15/2017



Plot Number: HDR6011_17 **Description:** Soil **Date:** 8/15/2017

Archer Lat: N 59. 35011 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6024-17Archer Long: W 154. 55379Wetland? ☒ Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Mac S. 2) Hana G. 3) _____
 Bear Guard: Nick Observer: _____
 Do 'Normal Circumstances' Exist? ☒ YES ☐ NO
 Is the Site Significantly Disturbed (Atypical Situation)? ☒ YES ☐ NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? ☒ YES ☐ NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/16/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 21 map date: 8/11/17
 Township: 9S Range: 31W
 Section: 31 S.M. Quad No.: Iliamna R-S
 General Location (opt): _____
 Site marked on map? ☒ Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
① <u>Vacc vit</u>	S	FAC	30			⑬ <u>Eg. ar.</u>	H	FAC	10		
② <u>Emp. n.</u>	S	FAC	55			⑭ <u>Tri. set</u>	H	FAC	5		
③ <u>Get. pan</u>	S	FAC	25			⑮ <u>Rub. cha</u>	H	FACW	T		
④ <u>Rha. tom</u>	S	FAC	10			⑯ <u>Sal. pal</u>	S	FAC	T		
⑤ <u>Sal. rich</u>	S	FACW	25			⑰ <u>Spi. stov</u>	S	FACW	3		
⑥ <u>Vacc. vit</u>	S	FAC	7			⑱					
⑦ <u>Sang. can</u>	H	FACW	7			⑲					
⑧ <u>Ret. fri</u>	H	FACW	T			⑳					
⑨ <u>Car. mic</u>	H	FAC	5			㉑					
⑩ <u>Cha. ang</u>	H	FACW	3			㉒ lichen					
⑪ <u>Cal. can</u>	H	FAC	10			㉓ moss (feather / sphagnum)					
⑫ <u>Car. sne</u>	H	FAC	T			㉔ bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by:

OBL species _____ X1= _____

FACW species 33 X2= 66

FAC species 157 X3= 471

FACU species 6 X4= 24

UPL + NL species _____ X5= _____

Column Totals: 196 (A) 561 (B)

Prevalence Index = B/A= 2.86

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: OWLS
 JDWet Code: W
 ENWI Code: PSSI/3B
 Hydrophytic Vegetation Indicators
☒ Dominance Test is >50%
☒ Prevalence Index is ≤3.0
☐ Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

☒ Y ☐ N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Open hollow low shrubs.
 Near wet/low boundary. Gets wetter towards SW

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? ☒ Y ☐ N
 Depth of Surface Water: 6"

Water Table Present? ☒ Y ☐ N
 Depth to Water Table: 16"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐

Restrictive Layer w/in 24"? Y ☒ N
 If Y, depth to Layer _____"
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____"

Saturated Soil Present? ☒ Y ☐ N
 Depth to saturation 6"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 4 (total)

☒ Surface Water (A1)
☒ High Water Table (A2)
☒ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Marl Deposits (B15)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☒ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Hydrogen Sulfide Odor (C1)
☐ Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
 Other (explain in Hydrology Comments)

Secondary Indicators 2 (total)

☐ Water-Stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospheres on Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☒ Geomorphic Position (D2)
☐ Shallow Aquitard (D3) (≠ frost)
☐ Micro-topographic Relief (D4)
☒ FAC-Neutral Test (D5)

Hydrology Comments:

Seeping in @ 11"
 Surface water present in hummock depressions down slope to the SW

Aspect: SW (cardinal) Slope: 3% Local relief: concave / convex / none
 HGM Class: slope Landform: swale Macrotopo (in poly): concave Microtopo: hummocky
 Are climatic/hydrologic conditions at the site typical for this time of year? ☒ Y ☐ N Unknown (Explain if N or Unknown)

Wetland Hydrology?

☒ Y ☐ N

Soils

PLOT NO: HDR 6024-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: SWPD Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-5	Oi												
5-6	Ash	10YR7/2		fsil	RMF	7.5YR5/6	5	RCPL				N	
6-9	Oeb												
9-11	Oab												
11-16	B	10YR3/3		sil								N	csa 5%

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☐ Alaska Color Change (TA4)
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox with 2.5Y Hue (4a3)
☐ Alaska Gleyed w/out Hue 5Y or Redder
☐ Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☐ Soils with Low Organic Carbon Content (4b1)
☐ Soils with Low Weatherable Iron Content (4b2)
☐ Soil pH Greater than 7.2 (4b3)
☐ Recently Developed Wetland (4b4)
☐ Positive α , α Test (60% of 4" layer) (4c)
☐ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: Layer of cobbles at 11" Large woody debris in the Oeb. *Organic accumulation on surface due to saturated conditions. Histic epipedon applies even though not underlain by chroma 2

No H₂S @ 12" 4' hydric indicators and veg by dominance of 10" organics in upper 11". Ash layer w/ 1% organics

Other Soil Observations:Major Rooting Zone: 5 in.Cryoturbated? Y NThixotropic? Y N**Hydric Soils?**Y N**Wetland Determination**

- Hydrophytic Vegetation Present? Yes No
 Wetland Hydrology Present? Yes No
 Hydric Soils Present? Yes No
 Plot Meets Wetland Criteria? Yes Yes-Transitional No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Mosambi</u>	<u>151</u>	<u>Soil</u>	<u>-</u>
(4 veg photos in each direction, if different;	<u>152</u>	<u>↓</u>	<u>-</u>
2 soil photos: soil	<u>153</u>	<u>veg</u>	<u>N</u>
Profile and above pit)	<u>154</u>	<u>↓</u>	<u>E</u>
	<u>155</u>	<u>↓</u>	<u>S</u>
	<u>156</u>	<u>↓</u>	<u>W</u>



Plot Number: HDR6024_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR6024_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR6024_17 Description: Soil Date: 8/16/2017



Plot Number: HDR6024_17 Description: Soil Date: 8/16/2017

Archer Lat: N 59. 35024 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6025-17Archer Long: W 154. 55357

Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) M. Salway 2) A. Gerick 3) _____
 Bear Guard: Nick S Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/16/2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska

Subregion: Western/Interior

Field Map: 21 map date: 8/10/17Township: 9S Range: 31WSection: 31 S.M. Quad No.: Elmanna B-5General Location (opt): _____Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. Emp nig	S	FAC	70			13. San can	H	FACW	3		
2. Bet nar	S	FAC	20			14. Rub cher	H	FACW	5		
3. Vac uli	S	FAC	50			15. Car SUE	H	FAC	5		
4. Spi ben (Spi ste)	S	FACU	15			16. Cal can	H	FAC	3		
5. Rho tom	S	FAC	15			17. Car big	H	FAC	3		
6. Vac vit	S	FAC	7			18.					
7. Sal pro	S	FACW	3			19.					
8. Arz alp	S	FACU	8			20.					
9. Sal gla	S	FAC	T			21.					
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.			150			24. bare ground			19		

Prevalence Index worksheet:

Total % Cover of

Multiply by:

OBL species — X1= —
 FACW species 11 X2= 22
 FAC species 173 X3= 519
 FACU species 23 X4= 92
 UPL + NL species — X5= —
 Column Totals: 207 (A) 633 (B)
 Prevalence Index = B/A= 3.06

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: DEST-HJDWet Code: —ENWI Code: —

Hydrophytic Vegetation Indicators

Y Dominance Test is >50%N Prevalence Index is ≤3.0— Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

(Y) N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y (N)

Depth of Surface Water: —

Water Table Present? Y (N)

Depth to Water Table: —Just seeping in at this level, not yet filled to this level? (check if yes) ☐

Restrictive Layer w/in 24"? Y (N)

If Y, depth to Layer —Restrictive Layer Type —If lateral flow, at what depth? —

Saturated Soil Present? Y (N)

Depth to saturation —

Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
— High Water Table (A2)
— Saturation (A3)
— Water Marks (B1)
— Sediment Deposits (B2)
— Drift Deposits (B3)
— Algal Mat or Crust (B4)
— Marl Deposits (B15)
— Iron Deposits (B5)
— Surface Soil Cracks (B6)
— Inundation Visible on Aerial Imagery (B7)
— Sparsely Vegetated Concave Surface (B8)
— Hydrogen Sulfide Odor (C1)
— Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
— Other (explain in Hydrology Comments)

Secondary Indicators 1 (total)

N Water-Stained Leaves (B9)
— Drainage Patterns (B10)
— Oxidized Rhizospheres on Living Roots (C3)
— Presence of Reduced Iron (C4)
— Salt Deposits (C5)
— Stunted or Stressed Plants (D1)
— Geomorphic Position (D2)
— Shallow Aquitard (D3) (≠ frost)
— Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: S (cardinal) Slope: S %HGM Class: — Landform: foot slopeLocal relief: concave / convex / noneMacrotopo (in poly): shallow concave Microtopo: large hummock

Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y (N)

Soils

PLOT NO: HDR 6025-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	Matrix (%)	Texture	Type ¹	Color	Redox Features (%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-4	Oi												
4-6	ash	10 YR 6/2	100	F SHH									
6-8	Oab												
8-16	A	7.5YR 2.5/2	100	SIL									
16-23	B1	7.5YR 3/3	70	SIL									10% granules
		7.5YR 2.5/1	30	SIL									

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:**Other Soil Observations:**Major Rooting Zone: 6 in.Cryoturbated? Y ☒ NThixotropic? Y ☒ N**Hydric Soils?**Y ☒ N**Wetland Determination**

- Hydrophytic Vegetation Present? Yes ☒ No
 Wetland Hydrology Present? Yes ☒ No
 Hydric Soils Present? Yes ☒ No
 Plot Meets Wetland Criteria? Yes Yes-Transitional ☒ No No-Transitional

Remarks:

approx 6' higher than 6024.
 upland CATS upslope to N, DEST-L to E + W
 game trail through area, visible on imagery

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Mosambi</u>	<u>157</u>	<u>soil</u>	<u>—</u>
(4 veg photos in each direction, if different;	<u>158</u>	<u>1</u>	<u>—</u>
2 soil photos: soil	<u>159</u>	<u>veg</u>	<u>N</u>
Profile and above pit)	<u>160</u>	<u>1</u>	<u>E</u>
	<u>161</u>	<u>1</u>	<u>S</u>
	<u>162</u>	<u>1</u>	<u>N</u>



Plot Number: HDR6025_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR6025_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR6025_17 Description: Soil Date: 8/16/2017



Plot Number: HDR6025_17 Description: Soil Date: 8/16/2017

Archer Lat: N 59. 35697 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6031-17Archer Long: W 154. 57982Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) M. Salway 2) A. Geruk 3) —
 Bear Guard: 10005 Observer: —
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro NO
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro NO

Date: 8/16/2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska Subregion: Western/Interior

Field Map: 10 map date: 8/11/17Township: 95 Range: 36WSection: 31 S.M. Quad No.: Ilamann B-5General Location (opt): —Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Aln vir</u>	<u>S</u>	<u>FAC</u>	<u>65</u>	<u>6-8</u>		13. <u>Cal car</u>	<u>H</u>	<u>FAC</u>	<u>30</u>		
2. <u>Sal pur</u>	<u>I</u>	<u>FAC</u>	<u>10</u>	<u>5</u>		14. <u>Cha ar</u>	<u>I</u>	<u>FACU</u>	<u>5</u>		
3. <u>Vac ill</u>	<u>I</u>	<u>FAC</u>	<u>10</u>			15. <u>Poa ad</u>	<u>I</u>	<u>FAC</u>	<u>3</u>		
4. <u>Sp. bra (Spi sta)</u>		<u>FACU</u>	<u>10</u>			16. <u>Tri lvs</u>	<u>I</u>	<u>FACU</u>	<u>3</u>		
5.						17. <u>Luc ann (Spi ann)</u>	<u>I</u>	<u>FACU</u>	<u>5</u>		
6.						18. <u>Dry exp</u>	<u>I</u>	<u>FACU</u>	<u>30</u>		
7.						19. <u>Gym ar</u>	<u>I</u>	<u>FACU</u>	<u>T</u>		
8.						20. <u>And vil</u>	<u>I</u>	<u>FACU</u>	<u>T</u>		
9.						21. <u>Coa tri</u>	<u>I</u>	<u>FAC</u>	<u>7</u>		
10.						22. lichen					
11. <u>Ste lvs</u>	<u>H</u>	<u>FAC</u>	<u>T</u>			23. moss (feather / sphagnum)					
12. <u>Ver vir</u>	<u>H</u>	<u>FAC</u>	<u>T</u>			24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by:

OBL species _____ X1= _____

FACW species _____ X2= _____

FAC species 125 X3= 375

FACU species 53 X4= 212

UPL + NL species _____ X5= _____

Column Totals: 170 (A) 587 (B)

Prevalence Index = B/A= 3.30

shrub - 95
herb - 83

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That are OBL, FACW, or FAC: 66 (A/B)

Project Veg Type: CATSJDWet Code: 2ENWI Code: 2

Hydrophytic Vegetation Indicators

Dominance Test is >50%

Prevalence Index is ≤3.0

Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N
 Depth of Surface Water: _____

Water Table Present? Y N
 Depth to Water Table: _____
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐

Restrictive Layer w/in 24"? Y N
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____

Saturated Soil Present? Y N
 Depth to saturation _____
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

2 Surface Water (A1)
1 High Water Table (A2)
1 Saturation (A3)
1 Water Marks (B1)
1 Sediment Deposits (B2)
1 Drift Deposits (B3)
1 Algal Mat or Crust (B4)
1 Marl Deposits (B15)
1 Iron Deposits (B5)
1 Surface Soil Cracks (B6)
1 Inundation Visible on Aerial Imagery (B7)
1 Sparsely Vegetated Concave Surface (B8)
1 Hydrogen Sulfide Odor (C1)
1 Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
 Other (explain in Hydrology Comments)

Secondary Indicators _____ (total)

2 Water-Stained Leaves (B9)
1 Drainage Patterns (B10)
1 Oxidized Rhizospheres on Living Roots (C3)
1 Presence of Reduced Iron (C4)
1 Salt Deposits (C5)
1 Stunted or Stressed Plants (D1)
1 Geomorphic Position (D2)
1 Shallow Aquitard (D3) (≠ frost)
1 Micro-topographic Relief (D4)
1 FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: NE (cardinal) Slope: 2 %Local relief: concave / convex / noneHGM Class: _____ Landform: valley bottom Macrotopo (in poly): slightly concave Microtopo: undulatingAre climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y N

Soils

PLOT NO: HDR 6031-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-4	Oi												
4-7	ash	10YR 6/2	95	F SIL	C	7.5YR 4/4	5	RCPL	f	f	p	N	
7-9	Oeb												
8-18	B	7.5YR 3/2	100	SIL									angular boulders & cobbles - 90%

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- N Histosol or Histel (A1)
N Histic Epipedon (A2)
N Hydrogen Sulfide (A4)
N Thick Dark Surface (A12)
N Alaska Gleyed (A13)
N Alaska Redox (A14)
N Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- N Alaska Color Change (TA4)
N Alaska Alpine Swales (TA5)
N Alaska Redox with 2.5Y Hue (4a3)
N Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- N Soils with Low Organic Carbon Content (4b1)
N Soils with Low Weatherable Iron Content (4b2)
N Soil pH Greater than 7.2 (4b3)
N Recently Developed Wetland (4b4)
N Positive α , α Test (60% of 4" layer) (4c)
N Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:**Other Soil Observations:**Major Rooting Zone: 7 in.Cryoturbated? Y NThixotropic? Y N**Hydric Soils?**Y N**Wetland Determination**Hydrophytic Vegetation Present? Yes NoWetland Hydrology Present? Yes NoHydric Soils Present? Yes NoPlot Meets Wetland Criteria? Yes Yes-Transitional No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Nasambi</u>	<u>190</u>	<u>soil</u>	<u>-</u>
(4 veg photos in each direction, if different;	<u>191</u>	<u>veg</u>	<u>N</u>
2 soil photos: soil	<u>192</u>	<u>veg</u>	<u>E</u>
Profile and above pit)	<u>193</u>	<u>veg</u>	<u>S</u>
	<u>194</u>	<u>veg</u>	<u>W</u>
	<u>195</u>	<u>veg</u>	<u>W</u>



Plot Number: HDR6031_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR6031_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR6031_17 Description: Soil Date: 8/16/2017



Plot Number: HDR6031_17 Description: Soil Date: 8/16/2017

Archer Lat: N 59. 35700 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6032-17Archer Long: W 154. 57859Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Mac S. 2) Alanna (2) 3) —
 Bear Guard: None Observer: —
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 5/16/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 20 map date: 8/11/17
 Township: 95 Range: 3W
 Section: 31 S.M. Quad No.: Elizabetta B-5
 General Location (opt): —
 Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Det nan</u>	<u>S</u>	<u>FAC</u>	<u>3</u>			13. <u>Ean ary</u>	<u>H</u>	<u>FAC</u>	<u>T</u>		
2. <u>Emp nig</u>	<u>S</u>	<u>FAC</u>	<u>10</u>			14. <u>Car rot</u>	<u>H</u>	<u>OBL</u>	<u>5</u>		
3. <u>Sal ret</u>	<u>S</u>	<u>FAC</u>	<u>4</u>			15. <u>Cal can</u>	<u>H</u>	<u>FAC</u>	<u>3</u>		
4. <u>Sal fng</u>	<u>S</u>	<u>FACW</u>	<u>5</u>			16. <u>Tri cao</u>	<u>H</u>	<u>OBL</u>	<u>10</u>		
5. <u>Sal pal</u>	<u>S</u>	<u>FAC</u>	<u>4</u>			17. <u>And pol</u>	<u>S</u>	<u>FACW</u>	<u>3</u>		
6. <u>Vacculi</u>	<u>S</u>	<u>FAC</u>	<u>15</u>			18. <u>Car manm</u>	<u>H</u>	<u>FACW</u>	<u>20</u>		
7. <u>Myr gale</u>	<u>S</u>	<u>OBL</u>	<u>7</u>			19. <u>Thuc oxy</u>	<u>S</u>	<u>OBL</u>	<u>T</u>		
8. <u>Rho toni</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			20. <u>Rub cha</u>	<u>FACW</u>	<u>FACW</u>	<u>T</u>		
9. <u>Corn sue</u>	<u>H</u>	<u>FAC</u>	<u>2</u>			21. <u>Par pal</u>	<u>H</u>	<u>FACW</u>	<u>T</u>		
10. <u>Car car</u>	<u>H</u>	<u>OBL</u>	<u>5</u>			22. lichen					
11. <u>Eri sch</u>	<u>H</u>	<u>OBL</u>	<u>20</u>			23. moss (feather / sphagnum)			<u>25</u>		
12. <u>Eri ang</u>	<u>H</u>	<u>OBL</u>	<u>15</u>			24. bare ground					

Prevalence Index worksheet:

Total % Cover of Multiply by:
 OBL species 62 X1= 62
 FACW species 28 X2= 56
 FAC species 48 X3= 144
 FACU species — X4= —
 UPL + NL species — X5= —
 Column Totals: 138 (A) 262 (B)

Prevalence Index = B/A = 1.90

Shrub - 56
 Herb - 82

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 6 (A)
 Total Number of Dominant Species Across All Strata: 6 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Moss is 70%

Project Veg Type: ESB/M
 JDWet Code: W
 ENWI Code: PSSI/EMH/C
 Hydrophytic Vegetation Indicators
 Dominance Test is >50%
 Prevalence Index is ≤3.0
 Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

[Poly herb] 3 Rumex acet T Ach mill T
Art art T Dars frnt T Viola larg T Car sax T
Pockets of FSM mixed in, as well as DRESTC Sam any T
Bistorta vivipara Herb FAC

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N
 Depth of Surface Water: 6"
 Water Table Present? Y N
 Depth to Water Table: 12"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y N
 If Y, depth to Layer —"
 Restrictive Layer Type —
 If lateral flow, at what depth? —"
 Saturated Soil Present? Y N
 Depth to saturation 0"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 4 (total)

X Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
— Water Marks (B1)
— Sediment Deposits (B2)
— Drift Deposits (B3)
— Algal Mat or Crust (B4)
— Marl Deposits (B15)
— Iron Deposits (B5)
— Surface Soil Cracks (B6)
X Inundation Visible on Aerial Imagery (B7)
— Sparsely Vegetated Concave Surface (B8)
— Hydrogen Sulfide Odor (C1)
— Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
— Other (explain in Hydrology Comments)

Secondary Indicators 2 (total)

— Water-Stained Leaves (B9)
— Drainage Patterns (B10)
X Oxidized Rhizospheres on Living Roots (C3)
— Presence of Reduced Iron (C4)
— Salt Deposits (C5)
— Stunted or Stressed Plants (D1)
— Geomorphic Position (D2)
— Shallow Aquitard (D3) (≠ frost)
— Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

Seeping in at 8". Pond and small ponded depressions w/ cobble bottoms interspersed w/ vegetation

Aspect: W (cardinal) Slope: 2 %Local relief: concave / convex / noneHGM Class: Slope Landform: swale Macrotopo (in poly): concave Microtopo: mod hummocky

Wetland Hydrology?

Y NAre climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Soils

PLOT NO: HDR 6032-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: VPD Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-8	Oe												
8-10	Ash	10YR6/2	85	7.5MR1/6	RMF	7.5MR1/6	15	RC, PL					
10-18	Oab												

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☐ Alaska Color Change (TA4)
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox with 2.5Y Hue (4a3)
☐ Alaska Gleyed w/out Hue 5Y or Redder
☐ Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☐ Soils with Low Organic Carbon Content (4b1)
☐ Soils with Low Weatherable Iron Content (4b2)
☐ Soil pH Greater than 7.2 (4b3)
☐ Recently Developed Wetland (4b4)
☐ Positive α , α Test (60% of 4" layer) (4c)
☐ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: 10-12" is Oe.
H₂S at 16"**Other Soil Observations:**Major Rooting Zone: 10 in.Cryoturbated? Y NThixotropic? Y N**Hydric Soils?**Y N**Wetland Determination**

Hydrophytic Vegetation Present?

Yes No

Wetland Hydrology Present?

Yes No

Hydric Soils Present?

Yes No

Plot Meets Wetland Criteria?

Yes Yes-Transitional No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Mysambi</u>	<u>196</u>	<u>soil</u>	<u>-</u>
(4 veg photos in each direction, if different;	<u>197</u>	<u>↓</u>	<u>-</u>
2 soil photos: soil	<u>198</u>	<u>veg</u>	<u>N</u>
Profile and above pit)	<u>199</u>	<u>↓</u>	<u>E</u>
	<u>200</u>	<u>↓</u>	<u>S</u>
	<u>201</u>	<u>↓</u>	<u>W</u>

MS 8/25/17



Plot Number: HDR6032_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR6032_17 **Description:** Vegetation **Date:** 8/16/2017



Plot Number: HDR6032_17 Description: Soil Date: 8/16/2017



Plot Number: HDR6032_17 Description: Soil Date: 8/16/2017

Archer Lat: N 59. 32719 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6036 - 17Archer Long: W 154. 23874Wetland? (Y) Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) M. Salway 2) A. Giesel 3) —
 Bear Guard: Nick Johnson Observer: —
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES (NO)
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES (NO)
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/17/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 31 map date: 8/11/17
 Township: 10S Range: 29W
 Section: 2 S.M. Quad No.: Flumma B-4
 General Location (opt): —
 Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
① Vae uli	S	FAC	35			⑬ Car rot	H	OBL	20		
② Emp nig		FAC	15			⑭ Tri cal		OBL	10		
3. Bot nm		FAC	10			15. Bry cal		FACW	5		
4. Sal rex		FAC	5			16. Art arc		FACU	T		
5. Sal pul		FAC	5			⑰ Eri ang		OBL	10		
6. Aord pol		FACW	3			18. Saw ang		FAC	+		
7. Das fru		FAC	3			⑱ Car mac		FACW	10		
8. Alm wr		FAC	T			20. Grass @ Bromus sp.		—	5		
9. Dic gla	sap	FACW	T			21. Rho mt		FAC	T		
10. —						22. lichen					
11. Tha alp	H	FAC	T			23. moss (feather / sphagnum)					
12. Cal (m)		FAC	3			24. bare ground					

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species	<u>40</u>	X1=	<u>40</u>
FACW species	<u>18</u>	X2=	<u>36</u>
FAC species	<u>76</u>	X3=	<u>220</u>
FACU species	<u>—</u>	X4=	<u>—</u>
UPL + NL species	<u>—</u>	X5=	<u>—</u>
Column Totals:	<u>134</u> (A)		<u>304</u> (B)

Prevalence Index = B/A = 2.27
 shrub - 76
 herb - 63

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 6 (A)
 Total Number of Dominant Species Across All Strata: 6 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: DEST-H
 JDWet Code: W
 ENWI Code: PS11EMCAM
 Hydrophytic Vegetation Indicators
 Dominance Test is >50%
 Prevalence Index is ≤3.0
 Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
(Y) N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Tr eur T Cam las T Sol mult
 Poa arc T Pin ul T Composite T
 Lag gla T Toj pus T
 small FSM to S

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? (Y) N
 Depth of Surface Water: 6"
 Water Table Present? (Y) N
 Depth to Water Table: 7"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer —"
 Restrictive Layer Type —
 If lateral flow, at what depth? —"
 Saturated Soil Present? (Y) N
 Depth to saturation 0"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 3 (total)

Y Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
— Sediment Deposits (B2)
— Drift Deposits (B3)
— Algal Mat or Crust (B4)
— Marl Deposits (B15)
— Iron Deposits (B5)
— Surface Soil Cracks (B6)
— Inundation Visible on Aerial Imagery (B7)
— Sparsely Vegetated Concave Surface (B8)
— Hydrogen Sulfide Odor (C1)
— Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
— Other (explain in Hydrology Comments)

Secondary Indicators 5 (total)

N Water-Stained Leaves (B9)
Y Drainage Patterns (B10)
Y Oxidized Rhizospheres on Living Roots (C3)
Y Presence of Reduced Iron (C4)
N Salt Deposits (C5)
Y Stunted or Stressed Plants (D1)
Y Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
Y Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

stream flowing N to S 20' W of plot

Aspect: S (cardinal) Slope: 1% Local relief: concave / convex / none
 HGM Class: slope Landform: bench Macrotopo (in poly): slightly concave Microtopo: med hum
 Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?
(Y) N

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: VPD

Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-4	Oi												
4-7	ash	10YR 6/1	90	F silt	C	7.5YR 6/6	10	RC, PL	C	f	p	N	varies in thickness around pit - 2-6"
7-11	Oeb												
11-16	B1	7.5YR 3/3	90	SiL	C	7.5YR 4/4	10	RC, PL	C	f	f	Y	
16-24	B2	10YR 3/3	100	SiL								Y	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
☒ Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α,α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

rocks at 25". No primary indicators of hydric soils. Redox concentrations in ash layer do not meet primary or problematic indicators b/c color of parent material is 10YR hue. Redox features + positive alpha-alpha indicate hydric conditions. Hydrophytic veg + primary hydro present.

Other Soil Observations:Major Rooting Zone: 10 in.Cryoturbated? Y ☒Thixotropic? Y ☒**Hydric Soils?**☒ Y ☐ N**Wetland Determination**

Hydrophytic Vegetation Present?

Yes ☒ No ☐

Wetland Hydrology Present?

Yes ☒ No ☐

Hydric Soils Present?

Yes ☒ No ☐

Plot Meets Wetland Criteria?

Yes ☒ Yes-Transitional ☐ No ☐ No-Transitional ☐**Remarks:**

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Mosambi</u>	<u>212</u>	<u>Sp1</u>	
(4 veg photos in each direction, if different;	<u>213</u>		
2 soil photos: soil	<u>214</u>	<u>veg</u>	<u>N</u>
Profile and above pit)	<u>215</u>		<u>E</u>
	<u>216</u>		<u>S</u>
	<u>217</u>		<u>W</u>
	<u>218</u>	<u>stream</u>	<u>up</u>
	<u>219</u>	<u>down</u>	



Plot Number: HDR6036_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR6036_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR6036_17 Description: Soil Date: 8/17/2017



Plot Number: HDR6036_17 Description: Soil Date: 8/17/2017

Archer Lat: N 59. 32757 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6037-17Archer Long: W 154. 23711Wetland? (Y) Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Mac S. 2) Hana G. 3) —
 Bear Guard: Nick Johnson Observer: —
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/17/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 31 map date: 8/11/17
 Township: 105 Range: 21W
 Section: 7 S.M. Quad No.: Iliamna B-4
 General Location (opt): —
 Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
① <u>Aln. vir</u>	<u>S</u>	<u>FAC</u>	<u>30</u>			⑬ <u>Eri. ang</u>	<u>H</u>	<u>OBL</u>	<u>10</u>		
② <u>Sp. ste</u>	<u>S</u>	<u>FACW</u>	<u>20</u>			⑭ <u>Eri. pet</u> ©	<u>H</u>	<u>FACW</u>	<u>8</u>		
③ <u>Emp. nig</u>	<u>S</u>	<u>FAC</u>	<u>3</u>			⑮ <u>Pr. betula</u> (Gen. cal.)	<u>H</u>	<u>FACW</u>	<u>10</u>		
④ <u>Vacc. vit</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			⑯ <u>Car. mem</u> ©	<u>H</u>	<u>FACW</u>	<u>15</u>		
⑤ <u>Vacc. vit</u>	<u>S</u>	<u>FAC</u>	<u>1</u>			⑰ <u>Car. mac</u>	<u>H</u>	<u>FACW</u>	<u>5</u>		
⑥ <u>Sal. alba</u>	<u>S</u>	<u>FAC</u>	<u>3</u>			⑱ <u>Car. sue</u>	<u>H</u>	<u>FAC</u>	<u>12</u>		
⑦ <u>Men. ferr</u>	<u>S</u>	<u>FACW</u>	<u>7</u>			⑲ <u>Cal. can</u>	<u>H</u>	<u>FAC</u>	<u>5</u>		
⑧ <u>Ver. vir</u>	<u>H</u>	<u>FAC</u>	<u>T</u>			⑳ <u>Lyc. ann</u> (Sp. ann)	<u>H</u>	<u>FACW</u>	<u>3</u>		
⑨ <u>Dry. exp</u>	<u>H</u>	<u>FACW</u>	<u>T</u>			㉑ <u>Hyg. luc</u>	<u>H</u>	<u>FACW</u>	<u>T</u>		
⑩ <u>Ger. ori</u>	<u>H</u>	<u>FACW</u>	<u>T</u>			㉒ lichen					
⑪ <u>Sang. can</u>	<u>H</u>	<u>FACW</u>	<u>3</u>			㉓ moss (feather / sphagnum)					
⑫ <u>Cha. ang</u>	<u>H</u>	<u>FACW</u>	<u>T</u>			㉔ bare ground					

Prevalence Index worksheet:

Total % Cover of

Multiply by:

OBL species 10 X1= 10
 FACW species 73463 X2= 22 126
 FAC species 61 5871 X3= 102 213
 FACU species 23 X4= 92
 UPL + NL species — X5= —

Column Totals: 322 167 (A) 366 (B)Prevalence Index = B/A = 2.97 441

shrub - 4181
 herb - 3186

2.64

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 86 (A)
 Total Number of Dominant Species Across All Strata: 167 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 8386 (A/B)

1 Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Between S 3 FAC (Car. ant) © 15% Herb FACW
In. Set T
Vac. oval T
Sal. pul 10 shrub FACW FA
Suit. gla 3 shrub FA

Project Veg Type: OALWSJDWet Code: 17ENWI Code: PSS1/EMIB

Hydrophytic Vegetation Indicators

Dominance Test is >50%

Prevalence Index is ≤3.0

Problematic Hydr. Veg? (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

(Y) N

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y (N)Depth of Surface Water: —Water Table Present? (Y) NDepth to Water Table: 12"Just seeping in at this level, not yet filled to this level? (check if yes) ☐Restrictive Layer w/in 24"? Y (N)If Y, depth to Layer —Restrictive Layer Type —If lateral flow, at what depth? —Saturated Soil Present? (Y) NDepth to saturation 2"

Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 2 (total)

N Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
N Water Marks (B1)
— Sediment Deposits (B2)
— Drift Deposits (B3)
— Algal Mat or Crust (B4)
— Marl Deposits (B15)
— Iron Deposits (B5)
— Surface Soil Cracks (B6)
— Inundation Visible on Aerial Imagery (B7)
— Sparsely Vegetated Concave Surface (B8)
— Hydrogen Sulfide Odor (C1)
— Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
— Other (explain in Hydrology Comments)

Secondary Indicators 3 (total)

N Water-Stained Leaves (B9)
— Drainage Patterns (B10)
X Oxidized Rhizospheres on Living Roots (C3)
X Presence of Reduced Iron (C4)
N Salt Deposits (C5)
— Stunted or Stressed Plants (D1)
— Geomorphic Position (D2)
— Shallow Aquitard (D3) (≠ frost)
— Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments: Stream (6037) to Mac eastAspect: S (cardinal) Slope: 3 %HGM Class: Slope Landform: Fertile slope Macrotopo (in poly): slightly concave Microtopo: mod. hummockAre climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

(Y) N

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: SWPD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-3	Oi												
3-7	Ash	2.5Y 7/2		fsi		7.5YR 5/6	20	RSN				Y	
7-12	Oeb												
12-16	B	10YR 4/2		Fsal		2.5Y 7/2		RSN				Y	15% burned organics

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☐ Alaska Color Change (TA4)
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox with 2.5Y Hue (4a3)
☐ Alaska Gleyed w/out Hue 5Y or Redder
☐ Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- ☐ Soils with Low Organic Carbon Content (4b1)
☐ Soils with Low Weatherable Iron Content (4b2)
☐ Soil pH Greater than 7.2 (4b3)
☐ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☐ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: No H₂S. 2 1st indicators of wetland hydrology and veg through both PI and R_h min. Landscape position at slope breaks also indicates wetland.

Other Soil Observations:

Major Rooting Zone: 7 in.

Cryoturbated? Y ☒ N

Thixotropic? Y ☒ N

Hydric Soils?

☒ Y ☐ N

Wetland Determination

Hydrophytic Vegetation Present?

☒ Yes ☐ No

Wetland Hydrology Present?

☒ Yes ☐ No

Hydric Soils Present?

☒ Yes ☐ No

Plot Meets Wetland Criteria?

☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Mosambi</u>	<u>soil</u>	<u>234</u>	
(4 veg photos in each direction, if different;	<u>soil</u>	<u>235</u>	
2 soil photos: soil	<u>veg</u>	<u>236</u>	<u>N</u>
Profile and above pit)	<u>↓</u>	<u>237</u>	<u>E</u>
		<u>238</u>	<u>S</u>
	<u>↓</u>	<u>239</u>	<u>W</u>



Plot Number: HDR6038_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR6038_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR6038_17 Description: Soil Date: 8/17/2017



Plot Number: HDR6038_17 Description: Soil Date: 8/17/2017

Archer Lat: N 59. 32185 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 4043-17Archer Long: W 154. 21905Wetland? (Y) Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) M. Salway 2) A. Gruk 3)
 Bear Guard: Nick S. Observer:
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/17/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 32 map date: 8/11/17
 Township: 105 Range: 29W
 Section: 7 S.M. Quad No.: Diamas B-4
 General Location (opt):
 Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Sal pul</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			13. <u>Eri ang</u>	<u>H</u>	<u>25</u>	<u>OBL</u>		
2. <u>Val uli</u>	<u>S</u>	<u>FAC</u>	<u>3</u>			14. <u>Tri can</u>	<u>H</u>	<u>8</u>	<u>OBL</u>		
3. <u>And pol</u>	<u>S</u>	<u>FACW</u>	<u>7</u>			15. <u>Com pal</u>	<u>H</u>	<u>20</u>	<u>OBL</u>		
4. <u>San gls</u>	<u>S</u>	<u>FACW</u>	<u>3</u>			16. <u>San ang</u>	<u>H</u>	<u>+</u>	<u>FAC</u>		
5. <u> </u>						17. <u>Can can</u>	<u>H</u>	<u>5</u>	<u>FAC</u>		
6. <u> </u>						18. <u>Apr sea</u>	<u>H</u>	<u>10</u>	<u>FAC</u>		
7. <u> </u>						19. <u>Bho int</u>	<u>H</u>	<u>+</u>	<u>FAC</u>		
8. <u>Eri sch</u>	<u>H</u>	<u>OBL</u>	<u>5</u>			20. <u>San can</u>	<u>H</u>	<u>5</u>	<u>FACW</u>		
9. <u>Car rot</u>	<u>H</u>	<u>OBL</u>	<u>5</u>			21. <u>Car rar</u>	<u>H</u>	<u>25</u>	<u>OBL</u>		
10. <u>Car fax</u>	<u>H</u>	<u>FACW</u>	<u>15</u>			22. <u>lichen</u>					
11. <u>Car sea</u>	<u>H</u>	<u>OBL</u>	<u>10</u>			23. <u>moss (feather / sphagnum)</u>		<u>35</u>			
12. <u>Car agl</u>	<u>H</u>	<u>OBL</u>	<u>5</u>			24. <u>bare ground</u>					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by:

OBL species 93 X1= 93
 FACW species 23 X2= 46
 FAC species 23 X3= 69
 FACU species X4=
 UPL + NL species X5=
 Column Totals: 139 (A) 208 (B)
 Prevalence Index = B/A= 1.50
 shrub - 11
 herb - 128

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 6 (A)
 Total Number of Dominant Species Across All Strata: 6 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: SSMWM
 JDWet Code: W
 ENWI Code: PEMIC
 Hydrophytic Vegetation Indicators
 Dominance Test is >50%
 Prevalence Index is ≤3.0
 Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
(Y) N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Trs set T Jun cast T Jun cast T
Trs pal T Jun cast T Jun cast T
Eleoc acit

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? (Y) N
 Depth of Surface Water: 4"
 Water Table Present? (Y) N
 Depth to Water Table: 7"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____"
 Restrictive Layer Type _____"
 If lateral flow, at what depth? _____"
 Saturated Soil Present? (Y) N
 Depth to saturation 0"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 4 (total)

Y Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
 Sediment Deposits (B2)
 Drift Deposits (B3)
 Algal Mat or Crust (B4)
 Marl Deposits (B15)
 Iron Deposits (B5)
 Surface Soil Cracks (B6)
 Inundation Visible on Aerial Imagery (B7)
 Sparsely Vegetated Concave Surface (B8)
Y Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
 Other (explain in Hydrology Comments)

Secondary Indicators 4 (total)

N Water-Stained Leaves (B9)
Y Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
Y Presence of Reduced Iron (C4)
N Salt Deposits (C5)
 Stunted or Stressed Plants (D1)
Y Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
Y Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

Water table seeping at 5" Two streams flow in a wetland - one from N.E. one from S. Join at center NW.

Aspect: N (cardinal) Slope: 5% Local relief: concave / convex / none
 HGM Class: Slope Landform: small Macrotopo (in poly): concave Microtopo: flat
 Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?
(Y) N

Soils

PLOT NO: HDR 6043-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: VPD Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-9	Oi												
9-12	Oe												
12-14	ash	10YR 7/1	100	FSH									15% pockets of coarse sand
14-16	B1	10YR 4/2	100	Sal								Y	high % of organics high % of organics, 80% cobble

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
☒ Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α_α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

this at 6"

Other Soil Observations:Major Rooting Zone: 11 in.Cryoturbated? Y ☒Thixotropic? Y ☒**Hydric Soils?**☒ Y ☐ N**Wetland Determination**

Hydrophytic Vegetation Present?

☒ Yes ☐ No

Wetland Hydrology Present?

☒ Yes ☐ No

Hydric Soils Present?

☒ Yes ☐ No

Plot Meets Wetland Criteria?

☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Mosambi</u>	<u>247</u>	<u>sq</u>	
(4 veg photos in each direction, if different;	<u>248</u>		
2 soil photos: soil	<u>249</u>	<u>veg</u>	<u>N</u>
Profile and above pit)	<u>250</u>	<u> </u>	<u>E</u>
	<u>251</u>	<u> </u>	<u>S</u>
	<u>252</u>	<u> </u>	<u>W</u>

253 ↑ stream 1 to E
254 ↓ stream 1255 ↑ stream 2 to NE
256 ↓ stream at convergence below plot



Plot Number: HDR6043_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR6043_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR6043_17 Description: Soil Date: 8/17/2017



Plot Number: HDR6043_17 Description: Soil Date: 8/17/2017

Archer Lat: N 59. 32156 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 1045-17Archer Long: W 154. 21613

Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) M. Salway 2) A. Gerkin 3) _____
 Bear Guard: Nick J Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/17/2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska

Subregion: Western/Interior

Field Map: 32 map date: 8/11/17Township: 105 Range: 29WSection: 8 S.M. Quad No.: Diamond B-4General Location (opt): _____Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collxn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Drub spe</u>	<u>5</u>	<u>FACU</u>	<u>90</u>			13. <u>Cal can</u>	<u>7</u>	<u>FAC</u>	<u>5</u>		
2. <u>thin vr</u>	<u>5</u>	<u>FAC</u>	<u>15</u>			14. <u>cha dry</u>	<u>7</u>	<u>FACU</u>	<u>5</u>		
3.						15. <u>dry ext</u>	<u>7</u>	<u>FACU</u>	<u>3</u>		
4.						16. <u>Pha can</u>	<u>7</u>	<u>FACU</u>	<u>3</u>		
5.						17. <u>San can</u>	<u>7</u>	<u>FACU</u>	<u>1</u>		
6.						18. <u>Ver vr</u>	<u>7</u>	<u>FAC</u>	<u>1</u>		
7.						19.					
8.						20.					
9.						21.					
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by:

OBL species _____ X1= _____
 FACW species _____ X2= _____
 FAC species 20 X3= 60
 FACU species 101 X4= 404
 UPL + NL species _____ X5= _____
 Column Totals: 121 (A) 464 (B)
 Prevalence Index = B/A = 3.83

shrub-105
herb-16

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 33 (A/B)

Project Veg Type: DALSJDWet Code: UENWI Code: U

Hydrophytic Vegetation Indicators

N Dominance Test is >50%

N Prevalence Index is ≤3.0

Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y (N)¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

light green signature on imagery on alder slopes =
Salmonberry
 plot limited to salmon berry - not
 CATS surrounding

Hydrology

Observations (Measured from gnd surface):

Surface Water Present? Y (N)
 Depth of Surface Water: _____
 Water Table Present? Y (N)
 Depth to Water Table: _____
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y (N)
 Depth to saturation _____
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
_____ High Water Table (A2)
_____ Saturation (A3)
_____ Water Marks (B1)
_____ Sediment Deposits (B2)
_____ Drift Deposits (B3)
_____ Algal Mat or Crust (B4)
_____ Marl Deposits (B15)
_____ Iron Deposits (B5)
_____ Surface Soil Cracks (B6)
_____ Inundation Visible on Aerial Imagery (B7)
_____ Sparsely Vegetated Concave Surface (B8)
_____ Hydrogen Sulfide Odor (C1)
_____ Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
 Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)
_____ Drainage Patterns (B10)
_____ Oxidized Rhizospheres on Living Roots (C3)
_____ Presence of Reduced Iron (C4)
_____ Salt Deposits (C5)
_____ Stunted or Stressed Plants (D1)
_____ Geomorphic Position (D2)
_____ Shallow Aquitard (D3) (≠ frost)
_____ Micro-topographic Relief (D4)
_____ FAC-Neutral Test (D5)

Hydrology Comments: Boulders drain quickly.Aspect: S (cardinal) Slope: 10 %HGM Class: _____ Landform: hillsideLocal relief: concave / (convex) / noneMacrotopo (in poly): convex Microtopo: noneAre climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y (N)

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-4	O1												
4-12	ash	10YR 4/2	40	FSTH								N	colors intermixed in
		10YR 6/2	60	PSH								N	ash layer
12-18	Oab												

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)
Primary Indicators

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
☒ Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

boulders at 18"
10" organic material separated by ash layer - not saturated,

Other Soil Observations:

 Major Rooting Zone: 3 in.

 Cryoturbated? Y ☒ N

 Thixotropic? Y ☒ N

Hydric Soils?

 Y ☒ N

Wetland Determination

- Hydrophytic Vegetation Present? Yes ☒ No
 Wetland Hydrology Present? Yes ☒ No
 Hydric Soils Present? Yes ☒ No
 Plot Meets Wetland Criteria? Yes Yes-Transitional ☒ No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Masambi</u>	<u>261</u>	<u>soil</u>	
(4 veg photos in each direction, if different;	<u>262</u>	<u>veg</u>	<u>N</u>
2 soil photos: soil	<u>263</u>		<u>E</u>
Profile and above pit)	<u>264</u>		<u>S</u>
	<u>265</u>		<u>W</u>
	<u>266</u>		



Plot Number: HDR6045_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR6045_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR6045_17 Description: Soil Date: 8/17/2017



Plot Number: HDR6045_17 Description: Soil Date: 8/17/2017

Archer Lat: N 59. 31745 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6053-17Archer Long: W 154. 17206Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Mac S. 2) Alena G. 3) _____
 Bear Guard: Mark J. Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/17/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 34 map date: 8/14/17
 Township: 10S Range: 29W
 Section: 9 S.M. Quad No.: Ilwamna B-4
 General Location (opt): _____
 Site marked on map? X

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>And pol</u>	<u>S</u>	<u>FACW</u>	<u>T</u>			13. <u>Eri sch</u>	<u>H</u>	<u>OBL</u>	<u>20</u>		
2. <u>Vacc nli</u>	<u>S</u>	<u>FAC</u>	<u>T</u>			14. <u>Car med</u> <u>sterminal</u>	<u>H</u>	<u>FACW</u>	<u>10</u>		
3. <u>Beet nan</u>	<u>S</u>	<u>FAC</u>	<u>3</u>			15. <u>Duncus tri</u> <u>sterminal</u>	<u>H</u>	<u>FACW</u>	<u>8</u>		
4. <u>Sat pal</u>	<u>S</u>	<u>FAC</u>	<u>3</u>			16. <u>Car sax</u> <u>sterminal</u>	<u>H</u>	<u>FACW</u>	<u>15</u>		
5. <u>Sat fus</u>	<u>S</u>	<u>FACW</u>	<u>T</u>			17. <u>Ti cae</u>	<u>H</u>	<u>OBL</u>	<u>30</u>		
6. _____						18. <u>Dras rot</u>	<u>H</u>	<u>OBL</u>	<u>T</u>		
7. <u>Trigl pal</u>	<u>H</u>	<u>OBL</u>	<u>5</u>			19. <u>Car liv</u>	<u>H</u>	<u>OBL</u>	<u>3</u>		
8. <u>Grass caes</u> <u>sterminal</u>	<u>H</u>	<u>FAC</u>	<u>T</u>			20. <u>Spar hyp</u>	<u>H</u>	<u>OBL</u>	<u>T</u>		
9. <u>Eg aru</u>	<u>H</u>	<u>FAC</u>	<u>T</u>			21. <u>Eri ang</u>	<u>H</u>	<u>OBL</u>	<u>10</u>		
10. <u>Grass sp.</u>	<u>H</u>	<u>FAC</u>	<u>T</u>			22. <u>lichen</u>					
11. <u>Car cap</u>	<u>H</u>	<u>FAC</u>	<u>T</u>			23. <u>moss (feather / sphagnum)</u>			<u>20</u>		
12. <u>Pin knl</u>	<u>H</u>	<u>OBL</u>	<u>T</u>			24. <u>bare ground</u>					

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species <u>68</u>	X1= <u>68</u>
FACW species <u>33</u>	X2= <u>66</u>
FAC species <u>6</u>	X3= <u>18</u>
FACU species <u>-</u>	X4= <u>-</u>
UPL + NL species <u>-</u>	X5= <u>-</u>
Column Totals: <u>107</u> (A)	<u>152</u> (B)
Prevalence Index = B/A= <u>1.42</u>	
<u>shrub - 6</u>	
<u>herb - 104</u>	

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: SSMWN
 JDWet Code: SEW
 ENWI Code: PEMIE
 Hydrophytic Vegetation Indicators
 Dominance Test is >50%
 Prevalence Index is ≤3.0
 Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N¹Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematicVegetation Comments: Moss 60%

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N
 Depth of Surface Water: 6"
 Water Table Present? Y N
 Depth to Water Table: 0"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y N
 If Y, depth to Layer _____"
 Restrictive Layer Type _____"
 If lateral flow, at what depth? _____"
 Saturated Soil Present? Y N
 Depth to saturation _____"
 Epi Endo Unknown (circle type of sat.) _____

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 5 (total)

X Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
N Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Marl Deposits (B15)
- Iron Deposits (B5)
X Surface Soil Cracks (B6)
X Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
X Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
- Other (explain in Hydrology Comments)

Secondary Indicators 2 (total)

N Water-Stained Leaves (B9)
- Drainage Patterns (B10)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Salt Deposits (C5)
- Stunted or Stressed Plants (D1)
Y Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
Y Micro-topographic Relief (D4)
- FAC-Neutral Test (D5)

Hydrology Comments:

water flows thru wetland in small channel - no channelized outletAspect: E (cardinal) Slope: 3 %Local relief: concave / convex/ noneHGM Class: Slope Landform: bench Macrotopo (in poly): concave Microtopo: FlatAre climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y N

Soils

PLOT NO: HDR 6053-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: VPD Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-4	Oi												
4-6	Ash	10YR 7/1		fsi									
6-15	Oeh												
15-18	Ash	10YR 6/1		fsi									Mixed w/ buried gravel 60%

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☐ Alaska Color Change (TA4)
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox with 2.5Y Hue (4a3)
☐ Alaska Gleyed w/out Hue 5Y or Redder
☐ Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☐ Soils with Low Organic Carbon Content (4b1)
☐ Soils with Low Weatherable Iron Content (4b2)
☐ Soil pH Greater than 7.2 (4b3)
☐ Recently Developed Wetland (4b4)
☐ Positive α,α Test (60% of 4" layer) (4c)
☐ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: Saturated
H₂O 3"**Other Soil Observations:**Major Rooting Zone: 10 in.Cryoturbated? Y NThixotropic? Y N**Hydric Soils?**Y N**Wetland Determination**

Hydrophytic Vegetation Present?

Yes No

Wetland Hydrology Present?

Yes No

Hydric Soils Present?

Yes No

Plot Meets Wetland Criteria?

Yes Yes-Transitional No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Mammals</u>	<u>306</u>	<u>Soil</u>	<u>—</u>
(4 veg photos in each direction, if different;	<u>307</u>	<u>↓</u>	<u>W</u>
2 soil photos: soil	<u>308</u>	<u>veg</u>	<u>N</u>
Profile and above pit)	<u>309</u>	<u>↓</u>	<u>E</u>
	<u>310</u>	<u>↓</u>	<u>S</u>
	<u>311</u>	<u>↓</u>	<u>W</u>
	<u>312</u>	<u>outlet</u>	



Plot Number: HDR6053_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR6053_17 **Description:** Vegetation **Date:** 8/17/2017



Plot Number: HDR6053_17 Description: Soil Date: 8/17/2017



Plot Number: HDR6053_17 Description: Soil Date: 8/17/2017

Archer Lat: N 59. 39408 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6062 -17Archer Long: W 154. 69093Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) M. Schrey 2) A. Gerke 3) -
 Bear Guard: Nick Johnson Observer: Nick Mike
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/16 /2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska

Subregion: Western/Interior

Field Map: 15 map date: 8/11/17Township: 9S Range: 32WSection: 16 S.M. Quad No.: Iliamna B-5General Location (opt): -Site marked on map? Y

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Emp nig</u>	<u>S</u>	<u>FAC</u>	<u>80</u>			13. <u>Rub cha</u>	<u>H</u>	<u>FACW</u>	<u>5</u>		
2. <u>Vac uli</u>	<u>S</u>	<u>FAC</u>	<u>30</u>			14. <u>Sal bar</u>	<u>I</u>	<u>FAC</u>	<u>3</u>		
3. <u>Rho tom</u>	<u>S</u>	<u>FAC</u>	<u>50</u>			15. <u>Cal can</u>		<u>FAC</u>	<u>7</u>		
4. <u>Sor ste</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			16.					
5. <u>Bet nig</u>	<u>S</u>	<u>FAC</u>	<u>40</u>			17.					
6. <u>Vac vit</u>	<u>S</u>	<u>FAC</u>	<u>7</u>			18.					
7.						19.					
8.						20.					
9.						21.					
10.						22. lichen			<u>5</u>		
11.						23. moss (feather / sphagnum)			<u>5</u>		
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of

Multiply by:

OBL species - X1= -
 FACW species 5 X2= 10
 FAC species 208 X3= 624
 FACU species - X4= -
 UPL + NL species - X5= -
 Column Totals: 213 (A) 624 (B)

Prevalence Index = B/A = 2.98Shrub - 205
Herb - 8

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Project Veg Type: DEST-HJDWet Code: 5ENWI Code: 5

Hydrophytic Vegetation Indicators

Y Dominance Test is >50%Y Prevalence Index is ≤3.0Y Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

(Y) N

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y (N)
 Depth of Surface Water: -
 Water Table Present? Y (N)
 Depth to Water Table: -
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer -
 Restrictive Layer Type -
 If lateral flow, at what depth? -
 Saturated Soil Present? Y (N)
 Depth to saturation -
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators (total)

N Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Marl Deposits (B15)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Hydrogen Sulfide Odor (C1)
- Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
- Other (explain in Hydrology Comments)

Secondary Indicators 2 (total)

N Water-Stained Leaves (B9)
- Drainage Patterns (B10)
- Oxidized Rhizopheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Salt Deposits (C5)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3) (≠ frost)
- Micro-topographic Relief (D4)
- FAC-Neutral Test (D5)

Hydrology Comments:

swale between two ponds. Hydrology by secondary indicators only.

Aspect: NE (cardinal) Slope: 4 %Local relief concave / convex / noneHGM Class: - Landform: swale Macrotopo (in poly): concave Microtopo: med humAre climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

(Y) N

Soils

PLOT NO: HDR 6062-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD

Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Redox Features Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-7	Oi												
7-10	ash	10YR 7/2	95	PSH	C	7.5YR 4/6	5	RLPL	F	F			
10-16	A	10YR 2/1	60	SIL									
16-21	B	10YR 3/2	40	SIL									
16-21	B	7.5YR 2.5/3	100	SIL									organics throughout

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
☒ Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematicOther Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

ash layer varies from 2-5" thick. Cobble at 24"

Other Soil Observations:

Major Rooting Zone: 10 in.

Cryoturbated? Y ☒ NThixotropic? Y ☒ N

Hydric Soils?

Y ☒ N

Wetland Determination

Hydrophytic Vegetation Present?

Yes ☒ No

Wetland Hydrology Present?

Yes ☒ No

Hydric Soils Present?

Yes ☒ No

Plot Meets Wetland Criteria?

Yes Yes-Transitional ☒ No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # Mosambi	361	Sq	-
(4 veg photos in each direction, if different;	362		-
2 soil photos: soil	363	veg	N
Profile and above pit)	364		E
	365		S
	366		W

UG 8/25/17



Plot Number: HDR6062_17 **Description:** Vegetation **Date:** 8/18/2017



Plot Number: HDR6062_17 **Description:** Vegetation **Date:** 8/18/2017



Plot Number: HDR6062_17 Description: Soil Date: 8/18/2017



Plot Number: HDR6062_17 Description: Soil Date: 8/18/2017

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
Investigator: 1) M. Sullivan 2) A. Gerlach 3) _____
Bear Guard: Nick Johnson Observer: Nick Mike
Do 'Normal Circumstances' Exist? YES NO
Is the Site Significantly Disturbed (Atypical Situation)? YES NO
(Indicators altered due to human acts or natural events) Veg Soil Hydro
Is the Area a Potential Problem Area? YES NO
(Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/18 /2017
County: Lake & Peninsula Borough/Kenai Borough
State: Alaska Subregion: Western/Interior
Field Map: 15 map date: 8/11/2017
Township: 9S Range: 32W
Section: 16 S.M. Quad No.: Ilamma B-5
General Location (opt): _____
Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Emp. str.</u>	<u>S</u>	<u>FAC</u>	<u>15</u>			13. <u>Car. bir.</u>	<u>H</u>	<u>FAC</u>	<u>40</u>		
2. <u>Bet. non</u>	<u>S</u>	<u>FAC</u>	<u>7</u>			14. <u>En. spr.</u>	<u>H</u>	<u>OBL</u>	<u>20</u>		
3. <u>Rho. tom</u>	<u>S</u>	<u>FAC</u>	<u>4</u>			15. <u>Car. spr.</u>	<u>H</u>	<u>OBL</u>	<u>3</u>		
4. <u>Vac. uli</u>	<u>S</u>	<u>FAC</u>	<u>3</u>			16. <u>Bro. rot</u>	<u>H</u>	<u>OBL</u>	<u>T</u>		
5. <u>Vac. oxy</u>	<u>S</u>	<u>OBL</u>	<u>3</u>			17.					
6. <u>Vac. vit</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			18.					
7. <u>And. pol</u>	<u>S</u>	<u>FACW</u>	<u>+</u>			19.					
8. <u>Sal. phl</u>	<u>S</u>	<u>FAC</u>	<u>+</u>			20.					
9. <u>Myr. gal</u>	<u>S</u>	<u>OBL</u>	<u>5</u>			21.					
10.						22. lichen			<u>30</u>		
11.						23. moss (feather / sphagnum)			<u>60</u>		
12.						24. bare ground			<u>-</u>		

Prevalence Index worksheet:

Total % Cover of _____ Multiply by: _____
OBL species 31 X1= 31
FACW species — X2= —
FAC species 74 X3= 222
FACU species — X4= —
UPL + NL species — X5= —
Column Totals: 103 (A) 253 (B)
Prevalence Index = B/A= 2.41

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)
Shrub 42 Herb 63

Project Veg Type: DEST-C
JDWet Code: W
ENWI Code: FEM/SS/BB
Hydrophytic Vegetation Indicators
X Dominance Test is >50%
X Prevalence Index is ≤3.0
Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
(Y) N

Vegetation Comments:

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y (N)
Depth of Surface Water: _____
Water Table Present? (Y) N
Depth to Water Table: 8 "
Just seeping in at this level, not yet filled to this level? (check if yes) ☐
Restrictive Layer w/in 24"? Y (N)
If Y, depth to Layer _____ "
Restrictive Layer Type _____
If lateral flow, at what depth? _____ "
Saturated Soil Present? (Y) N
Depth to saturation 4 "
Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 3 (total)

N Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
— Sediment Deposits (B2)
— Drift Deposits (B3)
— Algal Mat or Crust (B4)
— Marl Deposits (B15)
— Iron Deposits (B5)
— Surface Soil Cracks (B6)
— Inundation Visible on Aerial Imagery (B7)
Y Sparsely Vegetated Concave Surface (B8)
Y Hydrogen Sulfide Odor (C1)
Y Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
— Other (explain in Hydrology Comments)

Secondary Indicators _____ (total)

N Water-Stained Leaves (B9)
Y Drainage Patterns (B10)
— Oxidized Rhizopheres on Living Roots (C3)
Y Presence of Reduced Iron (C4)
N Salt Deposits (C5)
Y Stunted or Stressed Plants (D1)
Y Geomorphic Position (D2)
N Shallow Aquitard (D3) (# frost)
N Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: S (cardinal) Slope: 4 % Local relief: concave / convex / none
HGM Class: slope Landform: tree slope Macrotopo (in poly): slightly concave Microtopo: sm. hum
Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?
(Y) N

Soils

PLOT NO: HDR 60123-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: VPP Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-9	Oi												
9-11	ash	10YR 6/1	100	F silty									50% organics
11-13	Oeb												
15-20	B	10YR 3/2	100	CSal								Y	50% gravels

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α,α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:H₂S at 10"**Other Soil Observations:**Major Rooting Zone: 13 in.Cryoturbated? Y ☒ NThixotropic? ☒ Y N**Hydric Soils?**☒ Y N**Wetland Determination**

Hydrophytic Vegetation Present?

☒ Yes ☐ No

Wetland Hydrology Present?

☒ Yes ☐ No

Hydric Soils Present?

☒ Yes ☐ No

Plot Meets Wetland Criteria?

☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional**Remarks:**

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Mosambi</u>	<u>367</u>	<u>soil</u>	
(4 veg photos in each direction, if different;	<u>368</u>	<u>veg</u>	<u>N</u>
2 soil photos: soil	<u>370</u>		<u>E</u>
Profile and above pit)	<u>371</u>		<u>S</u>
	<u>372</u>		<u>W</u>



Plot Number: HDR6063_17 **Description:** Vegetation **Date:** 8/18/2017



Plot Number: HDR6063_17 **Description:** Vegetation **Date:** 8/18/2017



Plot Number: HDR6063_17 Description: Soil Date: 8/18/2017



Plot Number: HDR6063_17 Description: Soil Date: 8/18/2017

Archer Lat: N 59. 39205 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6070 6072-1Archer Long: W 154. 72342Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) M. Salway 2) A. Gerke 3) —
 Bear Guard: Nick Johnson Observer: Nick Johnson
 Do 'Normal Circumstances' Exist? YES (N) NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES (N) NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES (N) NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 6/18/2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska

Subregion: Western/Interior

Field Map: 14map date: 6/11/17Township: 9SRange: 32WSection: 18S.M. Quad No.: Ilama B-5

General Location (opt):

Site marked on map? XMarked on GPS as 6070 - Fixed

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Aln wr</u>	<u>S</u>	<u>FAC</u>	<u>20</u>	<u>6-10</u>		13. <u>Ral can</u>	<u>H</u>	<u>FAC</u>	<u>40</u>		
2. <u>Salix</u>	<u>S</u>	<u>FACW</u>	<u>15</u>			14. <u>Cha arg</u>	<u>S</u>	<u>FACW</u>	<u>10</u>		
3. <u>Ribes nud - black</u>	<u>S</u>	<u>FAC</u>	<u>7</u>			15. <u>Bry</u>	<u>S</u>	<u>FACW</u>	<u>15</u>		
4. <u>Salix</u>	<u>S</u>	<u>FAC</u>	<u>30%</u>	<u>6-10</u>		16. <u>Guth arg</u>	<u>S</u>	<u>FACW</u>	<u>5</u>		
5. <u>Salix</u>	<u>S</u>	<u>FACW</u>	<u>T</u>			17. <u>Hip mar</u>	<u>S</u>	<u>FACW</u>	<u>3</u>		
6. <u>Sal niph</u>	<u>S</u>	<u>—</u>	<u>10</u>			18. <u>Ang we</u>	<u>S</u>	<u>FACW</u>	<u>3</u>		
7.						19. <u>Trig ew</u>	<u>S</u>	<u>FACW</u>	<u>T</u>		
8.						20. <u>San can</u>	<u>S</u>	<u>FACW</u>	<u>T</u>		
9. <u>Rub red</u>	<u>H</u>	<u>FAC</u>	<u>T</u>			21. <u>Egv arv</u>	<u>S</u>	<u>FAC</u>	<u>8</u>		
10. <u>Spi ann</u>	<u>S</u>	<u>FACW</u>	<u>T</u>			22. <u>lichen</u>	<u>S</u>	<u>—</u>	<u>—</u>		
11. <u>Non mil</u>	<u>S</u>	<u>FACW</u>	<u>T</u>			23. <u>moss (feather / sphagnum)</u>					
12. <u>Pro lan</u>	<u>S</u>	<u>FACW</u>	<u>T</u>			24. <u>bare ground</u>					

Prevalence Index worksheet:

Total % Cover of

Multiply by:

OBL species — X1= —FACW species — X2= —FAC species 105 X3= 315FACU species 66 X4= 264UPL + NL species — X5= —Column Totals: 171 (A) 579 (B)Prevalence Index = B/A= 3.39

Dominance Test Worksheet:

Number of Dominant Species

That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant

Species Across All Strata: 4 (B)

Percent of Dominant Species

That are OBL, FACW, or FAC: 75 (A/B)Project Veg Type: CAWTSJDWet Code: —ENWI Code: —

Hydrophytic Vegetation Indicators

X Dominance Test is >50%

Prevalence Index is ≤3.0

Problematic Hydr. Veg¹ (see pg.

84 in 2007 Manual and explain)

Hydrophytic Vegetation?

(Y) N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematicVegetation Comments: 82% shrub, 84% herb

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y (N)Depth of Surface Water: —Water Table Present? Y (N)Depth to Water Table: —Just seeping in at this level, not yet filled to this level? (check if yes) ☐Restrictive Layer w/in 24"? Y (N)If Y, depth to Layer —Restrictive Layer Type —If lateral flow, at what depth? —Saturated Soil Present? Y (N)Depth to saturation —

Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)N Surface Water (A1)— High Water Table (A2)— Saturation (A3)— Water Marks (B1)— Sediment Deposits (B2)— Drift Deposits (B3)— Algal Mat or Crust (B4)— Marl Deposits (B15)— Iron Deposits (B5)— Surface Soil Cracks (B6)— Inundation Visible on Aerial Imagery (B7)— Sparsely Vegetated Concave Surface (B8)— Hydrogen Sulfide Odor (C1)— Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)— Other (explain in Hydrology Comments)Secondary Indicators 0 (total)N Water-Stained Leaves (B9)— Drainage Patterns (B10)— Oxidized Rhizospheres on Living

Roots (C3)

— Presence of Reduced Iron (C4)— Salt Deposits (C5)— Stunted or Stressed Plants (D1)— Geomorphic Position (D2)— Shallow Aquitard (D3) (≠ frost)— Micro-topographic Relief (D4)N FAC-Neutral Test (D5)

Hydrology Comments:

well drained hillside above wetlandAspect: NE (cardinal) Slope: 17 %HGM Class: — Landform: hillside

Local relief: concave / convex / none

Macrotopo (in poly): slightly concave Microtopo: undulatingAre climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

(Y) N

Soils

PLOT NO: HDR

6072 17
6070Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: VWD

Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-6	Oi												
6-8	ash	10YR 6/1	100	FS:IFC									
8-10	Oeb												
10-20	B	10YR 3/4	100	SaL									

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematicOther Hydric Soil Situations (see pg 88-91)³

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

Cobbles beginning at 5" - 80% 8" organic (separated by ash) but not saturated - not hydric

Other Soil Observations:

Major Rooting Zone: 9 in.Cryoturbated? Y ☒ NThixotropic? Y ☒ N

Hydric Soils?

Y ☒ N

Wetland Determination

Hydrophytic Vegetation Present?

Yes ☒ No

Wetland Hydrology Present?

Yes ☒ No

Hydric Soils Present?

Yes ☒ No

Plot Meets Wetland Criteria?

Yes Yes-Transitional ☒ No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoch # <u>Mossman</u>	<u>411</u>	<u>Soil</u>	
(4 veg photos in each direction, if different;	<u>412</u>		
2 soil photos: soil	<u>413</u>	<u>veg</u>	<u>N</u>
Profile and above pit)	<u>414</u>		<u>E</u>
	<u>415</u>		<u>S</u>
	<u>416</u>		<u>W</u>



Plot Number: HDR6072_17 **Description:** Vegetation **Date:** 8/18/2017



Plot Number: HDR6072_17 **Description:** Vegetation **Date:** 8/18/2017



Plot Number: HDR6072_17 Description: Soil Date: 8/18/2017



Plot Number: HDR6072_17 Description: Soil Date: 8/18/2017

Archer Lat: N 59. 39253 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6087-17Archer Long: W 154. 73492Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Mue S. 2) Alana G. 3) —
 Bear Guard: Nick J. Observer: Alana
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 7/19/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 14 map date: 8/11/17
 Township: 9S Range: 32W
 Section: 18 S.M. Quad No.: II, amny B-5
 General Location (opt): —
 Site marked on map? Y

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Egn flw</u>	H	OBL	8			13. <u>Sal pul</u>	S	FAC	5		
2. <u>Com pal</u>	H	OBL	10			14. <u>Bet x</u>		FAC	3		
3. <u>Egn air</u>		FAC	T			(15) <u>Myr gal</u>		OBL	40		
4. <u>Vista lary</u>		FACW	T			16. <u>Bet rian</u>		FAC	7		
5. <u>Par pal</u>		FACW	T			17. <u>Por, alan (sup)</u>		FACW	T		
6. <u>Car can</u>		FACW	5			18. <u>And pol</u>		FACW	T		
7. <u>Car ply</u>		OBL	5			19. <u>Car ten</u>	H	OBL	20		
8. <u>Car aqu</u>		OBL	15			20. <u>Car lep</u>	H	OBL	15		
9. <u>Grass sp.</u>			5			21.					
10. <u>Thi pa</u>		OBL	3			22. lichen					
11. <u>Grass horsea brv</u>		FAC	10			23. moss (feather / sphagnum)			20		
12. <u>Dros cat</u>		OBL	T			24. bare ground					

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species <u>111</u>	X1= <u>111</u>
FACW species <u>8</u>	X2= <u>16</u>
FAC species <u>25</u>	X3= <u>75</u>
FACU species <u>—</u>	X4= <u>—</u>
UPL + NL species <u>—</u>	X5= <u>—</u>
Column Totals: <u>144</u> (A)	<u>202</u> (B)
Prevalence Index = B/A = <u>1.40</u>	

Shrub - 55
herb - 99

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Project Veg Type: OSGB
 JDWet Code: W
 ENWI Code: PSS1/EMIF
 Hydrophytic Vegetation Indicators
 1 Dominance Test is >50%
 1 Prevalence Index is ≤3.0
 Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Stream flows through thickets Myr & gale
 large pockets of water w/ muddy bottom and equiflow
 Veg type covers most of the valley bottom

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N
 Depth of Surface Water: 2"
 Water Table Present? Y N
 Depth to Water Table: 0.4"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y N
 If Y, depth to Layer —"
 Restrictive Layer Type —
 If lateral flow, at what depth? —"
 Saturated Soil Present? Y N
 Depth to saturation 0.4"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 5 (total)

X Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
N Water Marks (B1)
— Sediment Deposits (B2)
— Drift Deposits (B3)
— Algal Mat or Crust (B4)
— Marl Deposits (B15)
— Iron Deposits (B5)
— Surface Soil Cracks (B6)
X Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
X Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
— Other (explain in Hydrology Comments)

Secondary Indicators 3 (total)

N Water-Stained Leaves (B9)
X Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
— Presence of Reduced Iron (C4)
— Salt Deposits (C5)
— Stunted or Stressed Plants (D1)
X Geomorphic Position (D2)
N Shallow Aquitard (D3) (# frost)
N Micro-topographic Relief (D4)
X FAC-Neutral Test (D5)

Hydrology Comments:

Wetland begins at toe of steep slope. Lots of seeps coming out at toe.
 Stream runs through valley center, multiple channels at some points. 2' wide, 6" deep

Aspect: NE (cardinal) Slope: 1%Local relief: concave / convex / noneHGM Class: Slope Landform: valley bottom Macrotopo (in poly): Concave Microtopo: s. hummocksAre climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)Wetland Hydrology? Y N

PLOT NO: HDR 6087-17

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

Primary Indicators

- ☐ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- _____ Alaska Color Change (TA4)
 _____ Alaska Alpine Swales (TA5)
 _____ Alaska Redox with 2.5Y Hue (4a3)
 _____ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- _____ Soils with Low Organic Carbon Content (4b1)
 _____ Soils with Low Weatherable Iron Content (4b2)
 _____ Soil pH Greater than 7.2 (4b3)
 _____ Recently Developed Wetland (4b4)
 _____ Positive α, α Test (60% of 4" layer) (4c)
 _____ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$
 from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

Other Soil Observations:

Major Rooting Zone: 10 in.

Cryoturbated? Y N

Thixotropic? ☒ Y ☐ N

Hydric Soils?

Y N

Hydrophytic Vegetation Present?

~~Yes~~ No

Wetland Hydrology Present?

☒ Yes ☐ No

Hydric Soils Present?

Yes No

Plot Meets Wetland Criteria?

Yes Yes-Transitional No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Mosambi</u>	<u>480-1</u>	<u>Soil</u>	
(4 veg photos in each	<u>472</u>	<u>N</u>	<u>↔ veg</u>
direction, if different;	<u>483</u>	<u>E</u>	<u> </u>
2 soil photos: soil	<u>474</u>	<u>S</u>	<u> </u>
Profile and above pit)	<u>485</u>	<u>W</u>	<u>↓</u>
	<u>486-488</u>	<u>up/down</u>	
		<u>changed</u>	



Plot Number: HDR6087_17 **Description:** Vegetation **Date:** 8/19/2017



Plot Number: HDR6087_17 **Description:** Vegetation **Date:** 8/19/2017



Plot Number: HDR6087_17 **Description:** Soil **Date:** 8/19/2017



Plot Number: HDR6087_17 **Description:** Soil **Date:** 8/19/2017

Archer Lat: N 59. 31656 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6139-17Archer Long: W 154. 19850

Wetland? (Y) Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Mue S 2) Erin C 3) —
 Bear Guard: Clyde T Observer: —
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/31/2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska

Subregion: Western/Interior

Field Map: 23 map date: 8/25/17Township: 10S Range: 29WSection: 17 S.M. Quad No.: ILWAM B-4General Location (opt): —Site marked on map? Y

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Bet ran</u>	S	FAC	8			13. <u>Tri cue</u>	H	OBL	45		
2. <u>Salix pulchra</u>	S	FAC	T			14. <u>Dian tri</u>	H	FAC W	3		
3. <u>Andromeda polifolia</u>	S	FAC W	T			15. <u>Car mac</u>	H	FAC W	3		
4. <u>Emp nig</u>	S	FAC	T			16. <u>Tof pen pns</u>	H	FAC	5		
5. <u>Vac ulig</u>	S	FAC	T			17. <u>Pros rot</u>	H	OBL	3		
6.						18. <u>Eri ang</u>	H	FAC W	T		
7.						19. <u>Ag scabra</u>	H	FAC	T		
8.						20. <u>Eri sch</u>	H	OBL	35		
9.						21. <u>Car ex rot</u>	H	OBL	10		
10.						22. lichen			5		
11. <u>Carex nana</u>	H	OBL	5			23. moss (feather / sphagnum)			30		
12. <u>Ang lucida</u>	H	FACU	T			24. bare ground			5		

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species 98 X1= 98

FACW species 6 X2= 12

FAC species 13 X3= 39

FACU species — X4= —

UPL + NL species — X5= —

Column Totals: 117 (A) 149 (B)

Prevalence Index = B/A = 1.27

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

S-8 H-104

Project Veg Type: SSMWM

JDWet Code: W

ENWI Code: PEMIE

Hydrophytic Vegetation Indicators

X Dominance Test is >50%

X Prevalence Index is ≤3.0

— Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

water 20%

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N

Depth of Surface Water: 3"

Water Table Present? Y N

Depth to Water Table: 5"

Just seeping in at this level, not yet filled to this level? (check if yes) ☐

Restrictive Layer w/in 24"? Y N

If Y, depth to Layer —"

Restrictive Layer Type —

If lateral flow, at what depth? —"

Saturated Soil Present? Y N

Depth to saturation 0.5' suta

Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 4 (total)

Y Surface Water (A1)

Y High Water Table (A2)

Y Saturation (A3)

— Water Marks (B1)

— Sediment Deposits (B2)

— Drift Deposits (B3)

— Algal Mat or Crust (B4)

— Marl Deposits (B15)

— Iron Deposits (B5)

— Surface Soil Cracks (B6)

— Inundation Visible on Aerial Imagery (B7)

— Sparsely Vegetated Concave Surface (B8)

Y Hydrogen Sulfide Odor (C1)

— Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)

— Other (explain in Hydrology Comments)

Secondary Indicators 2 (total)

— Water-Stained Leaves (B9)

— Drainage Patterns (B10)

— Oxidized Rhizospheres on Living Roots (C3)

— Presence of Reduced Iron (C4)

— Salt Deposits (C5)

Y Stunted or Stressed Plants (D1)

Y Geomorphic Position (D2)

— Shallow Aquitard (D3) (≠ frost)

— Micro-topographic Relief (D4)

Y FAC-Neutral Test (D5)

Hydrology Comments: Stream flowing through wetland. 6-24" wide. Cobble/organic bottom. 2-6" deep

Aspect: SW (cardinal) Slope: 2 %HGM Class: Slope Landform: depression/bench Local relief: concave / convex / noneMacrotopo (in poly): concave Microtopo: tussockAre climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y N

Soils

PLOT NO: HDR 6139-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: VPD Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Color(s)	Matrix (%)	Texture	Type ¹	Color	Redox Features (%) Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-4	Oi	—	—	—	—	—	—	—	—	—	—	—
4-8	Cash	10YR 6/1	100	Fine Silt	—	—	—	—	—	pas	pas	—
8-22	B	10YR 3/3	100	SaL	—	—	—	—	—	—	pas	—

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: H₂S @ 10". Positive α , α @ 6" and 12"**Other Soil Observations:**Major Rooting Zone: 8 in.Cryoturbated? Y ☒ NThixotropic? ☒ Y N**Hydric Soils?**☒ Y N**Wetland Determination**Hydrophytic Vegetation Present? ☒ Yes ☐ NoWetland Hydrology Present? ☒ Yes ☐ NoHydric Soils Present? ☒ Yes ☐ NoPlot Meets Wetland Criteria? ☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Mosses</u>	<u>724</u>	<u>Soil</u>	<u>—</u>
(4 veg photos in each direction, if different;	<u>725</u>	<u>↓</u>	<u>—</u>
2 soil photos: soil	<u>726</u>	<u>veg</u>	<u>N</u>
Profile and above pit)	<u>727</u>	<u>↓</u>	<u>E</u>
	<u>728</u>	<u>↓</u>	<u>S</u>
	<u>729</u>	<u>↓</u>	<u>W</u>

MS 9/11/17



Plot Number: HDR6139_17 **Description:** Vegetation **Date:** 8/31/2017



Plot Number: HDR6139_17 **Description:** Vegetation **Date:** 8/31/2017



Plot Number: HDR6139_17 Description: Soil Date: 8/31/2017



Plot Number: HDR6139_17 Description: Soil Date: 8/31/2017

Project/Site: Pebble Project **Applicant:** Pebble Limited Partnership
Investigator: 1) Mac S. 2) Erin C. 3) —
Bear Guard: Chloe T. **Observer:** —
Do 'Normal Circumstances' Exist? YES ☒ NO ☐
Is the Site Significantly Disturbed (Atypical Situation)? YES ☐ NO ☒
(Indicators altered due to human acts or natural events) Veg Soil Hydro
Is the Area a Potential Problem Area? YES ☐ NO ☒
(Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/31/2017
County: Lake & Peninsula Borough/Kenai Borough
State: Alaska Subregion: Western/Interior
Field Map: 7133 map date: 8/25
Township: 10S Range: 29W
Section: 17 S.M. Quad No.: T11cmmna B-4
General Location (opt): _____
Site marked on map? ☒

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if $>3"$ dbh, in Sapling/Shrub stratum if $<3"$ dbh. Herbs \neq woody.

Species (circle 50/20/20 dominants). © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/ Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/ Shrub Ht (ft)	DBH (in)
1. <u>Aln vir</u>	S	FAC	80	6		13. <u>Per sue</u>	H	FAC	3		
2. <u>Sp. ste</u>	S	FAC-U	20			14. <u>Dry xp</u>	H	FAC-U	20		
3. <u>Rub sp</u>	S	FAC-U	15			15. <u>Sp. ann</u>	H	FAC-U	5		
4. <u>Vacc ul</u>	S	FAC	8			16. <u>Chr ang</u>	H	FAC-U	T		
5. <u>Eum nig</u>	S	FAC	3			17. <u>Tri eur</u>	H	FAC-U	T		
6. <u>Rhus tom</u>	S	FAC	T			18. <u>Cal can</u>	H	FAC	10		
7. <u>Opl herb</u>	S	FAC-U	T			19. <u>Her lan</u>	H	FAC-U	3		
8. <u>Sal bar</u>	S	FAC	T			20. <u>stellaria lung</u>	H	FAC	T		
9. <u>Vac vit-id</u>	S	FAC	3			21. <u>Carex big</u>	H	FAC	5		
10.						22. lichen			0		
11.						23. moss (<u>feather</u> / sphagnum)			30		
12.						24. bare ground			5		

Prevalence Index worksheet: <table border="0"> <tr> <td>Total % Cover of</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species <u>—</u></td> <td>X1= <u>—</u></td> </tr> <tr> <td>FACW species <u>—</u></td> <td>X2= <u>—</u></td> </tr> <tr> <td>FAC species <u>112</u></td> <td>X3= <u>336</u></td> </tr> <tr> <td>FACU species <u>63</u></td> <td>X4= <u>252</u></td> </tr> <tr> <td>UPL + NL species <u>—</u></td> <td>X5= <u>—</u></td> </tr> <tr> <td>Column Totals: <u>175</u> (A)</td> <td><u>588</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A= <u>3.36</u></td> </tr> </table>		Total % Cover of	Multiply by:	OBL species <u>—</u>	X1= <u>—</u>	FACW species <u>—</u>	X2= <u>—</u>	FAC species <u>112</u>	X3= <u>336</u>	FACU species <u>63</u>	X4= <u>252</u>	UPL + NL species <u>—</u>	X5= <u>—</u>	Column Totals: <u>175</u> (A)	<u>588</u> (B)	Prevalence Index = B/A= <u>3.36</u>		Dominance Test Worksheet: Number of Dominant Species That are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That are OBL, FACW, or FAC: <u>67</u> (A/B) <u>S-129</u> <u>H-46</u>		Project Veg Type: <u>CATS</u> JDWet Code: <u>1</u> ENWI Code: <u>1</u> Hydrophytic Vegetation Indicators <u>Y</u> Dominance Test is >50% <u>—</u> Prevalence Index is ≤3.0 <u>—</u> Problematic Hydr. Veg ¹ (see pg. 84 in 2007 Manual and explain)		Hydrophytic Vegetation? <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">Y</div> <div style="margin-left: 20px;">N</div>	
Total % Cover of	Multiply by:																						
OBL species <u>—</u>	X1= <u>—</u>																						
FACW species <u>—</u>	X2= <u>—</u>																						
FAC species <u>112</u>	X3= <u>336</u>																						
FACU species <u>63</u>	X4= <u>252</u>																						
UPL + NL species <u>—</u>	X5= <u>—</u>																						
Column Totals: <u>175</u> (A)	<u>588</u> (B)																						
Prevalence Index = B/A= <u>3.36</u>																							
¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic																							
Vegetation Comments:																							

Hydrology

Observations (Measured from grnd surface): Surface Water Present? Y <u>N</u> Depth of Surface Water: <u> </u> " Water Table Present? Y <u>N</u> Depth to Water Table: <u> </u> " Just seeping in at this level, not yet filled to this level? (check if yes) <input type="checkbox"/> Restrictive Layer w/in 24"? Y <u>N</u> If Y, depth to Layer <u> </u> " Restrictive Layer Type <u> </u> If lateral flow, at what depth? <u> </u> " Saturated Soil Present? Y <u>N</u> Depth to saturation <u> </u> " Epi Endo Unknown (circle type of sat.)	2007 AK Supplement Hydrology Indicators (Measure from ground surface) Primary Indicators <u>0</u> (total) <u> </u> Surface Water (A1) <u> </u> High Water Table (A2) <u> </u> Saturation (A3) <u> </u> Water Marks (B1) <u> </u> Sediment Deposits (B2) <u> </u> Drift Deposits (B3) <u> </u> Algal Mat or Crust (B4) <u> </u> Marl Deposits (B15) <u> </u> Iron Deposits (B5) <u> </u> Surface Soil Cracks (B6) <u> </u> Inundation Visible on Aerial Imagery (B7) <u> </u> Sparsely Vegetated Concave Surface (B8) <u> </u> Hydrogen Sulfide Odor (C1) <u> </u> Dry-Season Water Table (C2) (mid May-July: H ₂ O w/in 24" min. soil or H ₂ O w/in 40" org. soil) <u> </u> Other (explain in Hydrology Comments)	Secondary Indicators <u>0</u> (total) <u> </u> Water-Stained Leaves (B9) <u> </u> Drainage Patterns (B10) <u> </u> Oxidized Rhizopheres on Living Roots (C3) <u> </u> Presence of Reduced Iron (C4) <u> </u> Salt Deposits (C5) <u> </u> Stunted or Stressed Plants (D1) <u> </u> Geomorphic Position (D2) <u> </u> Shallow Aquitard (D3) (# frost) <u> </u> Micro-topographic Relief (D4) <u> </u> FAC-Neutral Test (D5)
--	--	---

Hydrology Comments: <i>steep slope drains rapidly</i>	
Aspect: <u>W</u> (cardinal) Slope: <u>18</u> % HGM Class: <u>—</u> Landform: <u>hillslope</u> Macrotopo (in poly): <u>flat</u> Microtopo: <u>undulating</u>	Wetland Hydrology? Y <input checked="" type="radio"/> N <input type="radio"/> Unknown (Explain if N or Unknown)

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD

Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-4	O _i												
4-5	C _{ash}	10YR 7/1	100	fine Silt									
5-17	B ₁	10YR 2/2	100	Sal									
17-20	B ₂	10YR 4/3	100	Sal									

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- N Histosol or Histel (A1)
N Histic Epipedon (A2)
N Hydrogen Sulfide (A4)
N Thick Dark Surface (A12)
N Alaska Gleyed (A13)
N Alaska Redox (A14)
N Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- N Alaska Color Change (TA4)
N Alaska Alpine Swales (TA5)
N Alaska Redox with 2.5Y Hue (4a3)
N Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- N Soils with Low Organic Carbon Content (4b1)
N Soils with Low Weatherable Iron Content (4b2)
N Soil pH Greater than 7.2 (4b3)
N Recently Developed Wetland (4b4)
N Positive α,α Test (60% of 4" layer) (4c)
N Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: gravel encrusted (25%) at 8 inches bgs**Other Soil Observations:**Major Rooting Zone: 12 in.Cryoturbated? Y NThixotropic? Y N**Hydric Soils?**Y N**Wetland Determination**

Hydrophytic Vegetation Present?

Yes No

Wetland Hydrology Present?

Yes No

Hydric Soils Present?

Yes No

Plot Meets Wetland Criteria?

Yes Yes-Transitional No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # <u>MOSAMBI</u>	<u>732</u>	<u>SOIL</u>	<u>—</u>
(4 veg photos in each direction, if different;	<u>733</u>	<u>SOIL</u>	<u>—</u>
2 soil photos: soil	<u>734</u>	<u>veg</u>	<u>N</u>
Profile and above pit)	<u>735</u>	<u>↓</u>	<u>E</u>
	<u>736</u>	<u>↓</u>	<u>S</u>
	<u>737</u>	<u>↓</u>	<u>W</u>



Plot Number: HDR6140_17 **Description:** Vegetation **Date:** 8/31/2017



Plot Number: HDR6140_17 **Description:** Vegetation **Date:** 8/31/2017



Plot Number: HDR6140_17 Description: Soil Date: 8/31/2017



Plot Number: HDR6140_17 Description: Soil Date: 8/31/2017

Archer Lat: N 59. 33403 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6142-17Archer Long: W 154. 48500Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) M. Salway 2) Erin Cunningham 3) _____
 Bear Guard: Clyde Treforn Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 8/31/2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska

Subregion: Western/Interior

Field Map: 23map date: 8/25Township: 105Range: 31WSection: 3S.M. Quad No.: ILR B-4

General Location (opt): _____

Site marked on map? Y

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Emp. nigrum</u>	S	FAC	70			13. <u>Ang. lucida</u>	H	FAC-U	T		
2. <u>Salix v. ulig</u>	S	FAC	30			14. <u>cal can</u>	H	FAC	10		
3. <u>Salix bar</u>	S	FAC	12			15. <u>cham ang</u>	H	FAC-U	5		
4. <u>Lupinus arcticus</u>	S	FAC-U	10			16. <u>Gelium colu</u>	H	FAC W	5		
5. <u>Salix glauca</u>	S	FAC	5			17. <u>Cornus sene</u>	H	FAC	3		
6. <u>Salix pulchra</u>	S	FAC	5			18. <u>Carex micro</u>	H	FAC	7		
7. <u>Salix arctica</u>	S	FAC-U	8			19. <u>Carex big</u>	H	FAC	3		
8. <u>Aristoph. alpinu</u>	S	FAC-U	5			20. <u>Iris set</u>	H	FAC	T		
9. <u>Rho torn</u>	S	FAC	5			21. <u>open water</u>			5		
10.						22. lichen			10		
11.						23. moss (feather / sphagnum)			30		
12.						24. bare ground			0		

Prevalence Index worksheet:

Total % Cover of _____ Multiply by:

OBL species _____ X1= _____
 FACW species 5 X2= 10
 FAC species 150 X3= 450
 FACU species 28 X4= 112
 UPL + NL species _____ X5= _____
 Column Totals: 183 (A) 572 (B)
 Prevalence Index = B/A= 3.13

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)
5-150 H-33

Project Veg Type: DEST-HJDWet Code: UENWI Code: U

Hydrophytic Vegetation Indicators

X Dominance Test is >50%
= Prevalence Index is ≤3.0
= Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation? (Y) N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Salix comb = 20%
South transition to low OALS (upland)

Hydrology

Observations (Measured from gmd surface):

Surface Water Present? (Y) N
 Depth of Surface Water: _____"
 Water Table Present? (Y) N
 Depth to Water Table: 8"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____"
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____"
 Saturated Soil Present? (Y) N
 Depth to saturation 4"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 3 (total)

Y Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
 Sediment Deposits (B2)
 Drift Deposits (B3)
 Algal Mat or Crust (B4)
 Marl Deposits (B5)
 Iron Deposits (B5)
 Surface Soil Cracks (B6)
 Inundation Visible on Aerial Imagery (B7)
 Sparsely Vegetated Concave Surface (B8)
 Hydrogen Sulfide Odor (C1)
Y Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
 Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments:

Surface water in bldg hummocks; inundating Lupinus & Empetrum nigrum (still alive)
Swale at top of hill; seems to collect rainwater
High recent precipitation

Aspect: N (cardinal) Slope: 2 %
 HGM Class: _____ Landform: Swale
 Local relief: concave / convex / none
 Macrotopo (in poly): Concave Microtopo: Large hummock
 Are climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Wetland Hydrology? (Y) N

Soils

PLOT NO: HDR 614Z17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: SPD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.


²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- _____ Histosol or Histel (A1)
 _____ Histic Epipedon (A2)
 _____ Hydrogen Sulfide (A4)
 _____ Thick Dark Surface (A12)
 _____ Alaska Gleyed (A13)
 _____ Alaska Redox (A14)
 _____ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- 
 Alaska Color Change (TA4)
 Alaska Alpine Swales (TA5)
 Alaska Redox with 2.5Y Hue (4a3)
 Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- Soils with Low Organic Carbon Content (4b1)
Soils with Low Weatherable Iron Content (4b2)
Soil pH Greater than 7.2 (4b3)
Recently Developed Wetland (4b4)
Positive α, α Test (60% of 4" layer) (4c)
Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$
from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: water @ 8" ; saturated at 4" ; large cobbles (angular) @ 8" (80%).

Other Soil Observations:

Major Rooting Zone: 10 in.

Cryoturbated? ☒ Y ☐ N

Thixotropic? Y ☒ N

Hydric Soils?

Y N

Wetland Determination

Hydrophytic Vegetation Present?

Yes No

Wetland Hydrology Present?

Yes No

Hydric Soils Present?

Yes ☒ No

Plot Meets Wetland Criteria?

Yes Yes-Transitional No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # <u>MOLANBY</u>	<u>744</u>	<u>SOIL</u>	
(4 veg photos in each	<u>745</u>	<u>SOIL</u>	
direction, if different;	<u>746</u>		<u>N</u>
2 soil photos: soil	<u>747</u>		<u>E</u>
Profile and above pit)	<u>748</u>		<u>S</u>
	<u>749</u>		<u>W</u>



Plot Number: HDR6142_17 **Description:** Vegetation **Date:** 8/31/2017



Plot Number: HDR6142_17 **Description:** Vegetation **Date:** 8/31/2017



Plot Number: HDR6142_17 Description: Soil Date: 8/31/2017



Plot Number: HDR6142_17 Description: Soil Date: 8/31/2017

Archer Lat: N 59. 40003 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6162-17Archer Long: W 154. 78740Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Mac S. 2) Erin C. 3) _____
 Bear Guard: Clyde Treforn Observer: Nick A. Mike
 Do 'Normal Circumstances' Exist? (YES) NO
 Is the Site Significantly Disturbed (Atypical Situation)? (YES) NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? (YES) NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/11/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 8 map date: 8/25
 Township: 95 Range: 23W
 Section: 14 S.M. Quad No.: Ilamna B-5
 General Location (opt): _____
 Site marked on map? ✓

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Salix borealis</u>	<u>S</u>					13. <u>Viola longsdorfi</u>	<u>H</u>	<u>FACW</u>	<u>55</u>		
2. <u>Betula nana</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			14. <u>Chamaenerion</u>	<u>H</u>	<u>FACU</u>	<u>30</u>		
3. <u>Spiraea</u>	<u>S</u>	<u>FACU</u>	<u>7</u>			15. <u>Achillea</u>	<u>H</u>	<u>FACU</u>	<u>15</u>		
4. <u>Salix richardsonii</u>	<u>S</u>	<u>FACW</u>	<u>40</u>	<u><3'</u>	<u>-</u>	16. <u>Geranium eri</u>	<u>H</u>	<u>FACU</u>	<u>5</u>		
5. <u>Salix glauca</u>	<u>S</u>	<u>FAC</u>	<u>40</u>	<u><3'</u>	<u>-</u>	17. <u>Tridentalis euro</u>	<u>H</u>	<u>FACU</u>	<u>T</u>		
6.						18. <u>Iris set</u>	<u>H</u>	<u>FAC</u>	<u>T</u>		
7.						19.					
8.						20.					
9.						21.					
10.						22. lichen					
11.						23. moss (feather / sphagnum)					
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by: _____
 OBL species _____ X1= _____
 FACW species 95 X2= 190
 FAC species 45 X3= 135
 FACU species 50 X4= 200
 UPL + NL species _____ X5= _____
 Column Totals: 190 (A) 525 (B)
 Prevalence Index = B/A = 2.76

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 75% (A/B)
S-85 H-105

Project Veg Type: CWLS
 JDWet Code: UN (upland)
 ENWI Code: U
 Hydrophytic Vegetation Indicators
 X Dominance Test is >50%
 X Prevalence Index is ≤3.0
 Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
(Y) N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Hydrology

Observations (Measured from ground surface):

Surface Water Present? Y (N)
 Depth of Surface Water: _____
 Water Table Present? Y (N)
 Depth to Water Table: _____
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? Y (N)
 Depth to saturation _____
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
— High Water Table (A2)
— Saturation (A3)
— Water Marks (B1)
— Sediment Deposits (B2)
— Drift Deposits (B3)
— Algal Mat or Crust (B4)
— Marl Deposits (B15)
— Iron Deposits (B5)
— Surface Soil Cracks (B6)
— Inundation Visible on Aerial Imagery (B7)
— Sparsely Vegetated Concave Surface (B8)
✓ Hydrogen Sulfide Odor (C1)
— Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
— Other (explain in Hydrology Comments)

Secondary Indicators 1 (total)

N Water-Stained Leaves (B9)
— Drainage Patterns (B10)
— Oxidized Rhizospheres on Living Roots (C3)
— Presence of Reduced Iron (C4)
— Salt Deposits (C5)
— Stunted or Stressed Plants (D1)
— Geomorphic Position (D2)
— Shallow Aquitard (D3) (≠ frost)
— Micro-topographic Relief (D4)
✓ FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: SE (cardinal) Slope: — %
 HGM Class: _____ Landform: Depression Macrotopo (in poly): Slightly concave Microtopo: Undulating
 Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?
(Y) (N)

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	Matrix (%)	Texture	Type ¹	Redox Features Color (%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-5	Oi	—	—	—	—	—	—	—	—	—	—	—
5-9	A	7.5YR 2.5/1	100	SiL	—	—	—	—	—	—	—	—
9-17	B ₁	7.5YR 3/2	100	SiL	—	—	—	—	—	—	—	10% gravels
17-19	B ₂	10YR 3/3	100	SiL	—	—	—	—	—	—	—	10% gravels

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

☒ Histosol or Histel (A1)

☒ Histic Epipedon (A2)

☒ Hydrogen Sulfide (A4)

☒ Thick Dark Surface (A12)

☒ Alaska Gleyed (A13)

☒ Alaska Redox (A14)

☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

☒ Alaska Color Change (TA4)

☒ Alaska Alpine Swales (TA5)

☒ Alaska Redox with 2.5Y Hue (4a3)

☒ Alaska Gleyed w/out Hue 5Y or Redder Underlying layer (4a4)

Other Hydric Soil Situations (see pg 88-91)³

☒ Soils with Low Organic Carbon Content (4b1)

☒ Soils with Low Weatherable Iron Content (4b2)

☒ Soil pH Greater than 7.2 (4b3)

☒ Recently Developed Wetland (4b4)

☒ Positive α,α Test (60% of 4" layer) (4c)

☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Soil Comments: NOT SATURATED NO H₂S

Other Soil Observations:

Major Rooting Zone: 14 in. Cryoturbated? Y ☒ N Thixotropic? Y ☒ N

Hydric Soils? Y ☒ N

Wetland Determination

Hydrophytic Vegetation Present? ☒ Yes ☒ No

Wetland Hydrology Present? ☒ Yes ☒ No

Hydric Soils Present? ☒ Yes ☒ No

Plot Meets Wetland Criteria? Yes Yes-Transitional ☒ No No-Transitional

Remarks:

Archer #	<u>—</u>	Photo #	<u>846</u>	Subject	<u>SOIL</u>	Bearing	<u>—</u>
Ricoh #	<u>MOSBY</u>	<u>847</u>	<u>848</u>	<u>SOIL</u>	<u>—</u>	<u>—</u>	<u>—</u>
(4 veg photos in each direction, if different;		<u>849</u>	<u>veg</u>	<u>—</u>	<u>—</u>	<u>N</u>	<u>—</u>
2 soil photos: soil		<u>850</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>E</u>	<u>—</u>
Profile and above pit)		<u>851</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>S</u>	<u>—</u>
			<u>↓</u>	<u>—</u>	<u>—</u>	<u>W</u>	<u>—</u>



Plot Number: HDR6162_17 **Description:** Vegetation **Date:** 9/1/2017



Plot Number: HDR6162_17 **Description:** Vegetation **Date:** 9/1/2017



Plot Number: HDR6162_17 Description: Soil Date: 9/1/2017



Plot Number: HDR6162_17 Description: Soil Date: 9/1/2017

Archer Lat: N 59. 33.276 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 670-17Archer Long: W 154. 24155Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Mae S. 2) Eric C. 3) —
 Bear Guard: Chad Trofan Observer: —
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/2/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 31 map date: 8/05
 Township: 105 Range: 29W
 Section: 6 S.M. Quad No.: II B-4
 General Location (opt): —
 Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.
 Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Emp. nigrum</u>	<u>C</u>	<u>FAC</u>	<u>30</u>			13. <u>Carex big</u>	<u>H</u>	<u>FAC</u>	<u>10</u>		
2. <u>Alnus virido</u>	<u>S</u>	<u>FAC</u>	<u>15</u>			14. <u>Cal can</u>	<u>H</u>	<u>FAC</u>	<u>30</u>		
3. <u>vac ulig</u>	<u>S</u>	<u>FAC</u>	<u>30</u>			15. <u>Cornus seu</u>	<u>H</u>	<u>FAC</u>	<u>10</u>		
4. <u>Salix pulcra</u>	<u>S</u>	<u>FAC</u>	<u>15</u>			16. <u>Egri arv</u>	<u>H</u>	<u>FAC</u>	<u>T</u>		
5. <u>Bet nana</u>	<u>S</u>	<u>FAC</u>	<u>30</u>			17. <u>Spin anno</u>	<u>H</u>	<u>FACU</u>	<u>3</u>		
6. <u>And pol</u>	<u>S</u>	<u>FACW</u>	<u>3</u>			18. <u>Geran eri</u>	<u>H</u>	<u>FACU</u>	<u>4</u>		
7. <u>Spiraea stev</u>	<u>S</u>	<u>FACU</u>	<u>5</u>			19. <u>Rhod int (sodium ros)</u>	<u>H</u>	<u>FAC</u>	<u>3</u>		
8. <u>Rho tom</u>	<u>S</u>	<u>FAC</u>	<u>T</u>			20. <u>Ang luc</u>	<u>H</u>	<u>FACU</u>	<u>5</u>		
9. <u>Eri sch</u>	<u>H</u>	<u>OBL</u>	<u>20</u>			21. <u>Rubus arct</u>	<u>H</u>	<u>FAC</u>	<u>3</u>		
10. <u>Sarg can</u>	<u>H</u>	<u>FACW</u>	<u>12</u>			22. lichen			<u>T</u>		
11. <u>Geum calth</u>	<u>H</u>	<u>FACW</u>	<u>3</u>			23. moss (feather / sphagnum)			<u>50/50</u>		
12. <u>Achillea mil</u>	<u>H</u>	<u>FACU</u>	<u>T</u>			24. bare ground			<u>0</u>		

Prevalence Index worksheet:

Total % Cover of Multiply by:
 OBL species 25 X1= 25
 FACW species 27 X2= 54
 FAC species 186 X3= 543
 FACU species 17 X4= 68
 UPL + NL species — X5= —
 Column Totals: 850 (A) 690 (B)
 Prevalence Index = B/A = 2.76

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 6 (A)
 Total Number of Dominant Species Across All Strata: 6 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)
S-128 H-122

Project Veg Type: LEST
 JDWet Code: W
 ENWI Code: ISS/EMIB
 Hydrophytic Vegetation Indicators
 X Dominance Test is >50%
 X Prevalence Index is ≤3.0
 Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Viola langdorfi H FACW 3 Sweetbair per H FACW 1 Carex macrocarpa H FACW 3
Tri spic H FAC 5 Phacopis on H FACU 1 Sen trian H FACW 1
Enigeron per H FACW 3 Carex aqu H OBL 5

Hydrology

Observations (Measured from gmd surface):

Surface Water Present? Y N
 Depth of Surface Water: 6 "
 Water Table Present? Y N
 Depth to Water Table: 8 "
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y N
 If Y, depth to Layer — "
 Restrictive Layer Type —
 If lateral flow, at what depth? — "
 Saturated Soil Present? Y N
 Depth to saturation 4 "
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 5 (total)

Y Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
— Sediment Deposits (B2)
— Drift Deposits (B3)
— Algal Mat or Crust (B4)
Y Marl Deposits (B15)
N Iron Deposits (B5)
— Surface Soil Cracks (B6)
— Inundation Visible on Aerial Imagery (B7)
Y Sparsely Vegetated Concave Surface (B8)
Y Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
— Other (explain in Hydrology Comments)

Secondary Indicators 1 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
N Oxidized Rhizopheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (# frost)
N Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments: 2+Hmo (multiple) streams run through this area

Aspect: SW (cardinal) Slope: 4 % Local relief: concave / convex / none (small)
 HGM Class: Slope Landform: Footslope Macrotopo (in poly): Concave Microtopo: Hummocks
 Are climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y N

Soils

PLOT NO: HDR 6170-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: VPD

Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-8	Oi	—	—	—	—	—	—	—	—	—	—	—	—
8-11	C (ash)	10YR 7/1	100	fine silt	—	—	—	—	—	—	—	Y	—
11-15+	Oe	—	—	—	—	—	—	—	—	—	—	—	—
15-22	A	10YR 3/3	100	Sal	—	—	—	—	—	—	—	Y	↑% org

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ N Histosol or Histel (A1)
☒ N Histic Epipedon (A2)
☒ Y Hydrogen Sulfide (A4)
☒ N Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ N Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ N Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α,α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: H2S @ 7" high % of organics in bottom A layer**Other Soil Observations:**Major Rooting Zone: 12 in.Cryoturbated? Y ☒ NThixotropic? Y ☒ N**Hydric Soils?**☒ Y ☐ N**Wetland Determination****Hydrophytic Vegetation Present?**☒ Yes ☐ No**Wetland Hydrology Present?**☒ Yes ☐ No**Hydric Soils Present?**☒ Yes ☐ No**Plot Meets Wetland Criteria?**☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional**Remarks:**

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Mosambi</u>	<u>885</u>	<u>soil</u>	<u>—</u>
(4 veg photos in each direction, if different;	<u>886</u>	<u>↓</u>	<u>—</u>
2 soil photos: soil	<u>887</u>	<u>veg</u>	<u>N</u>
Profile and above pit)	<u>888</u>	<u>↓</u>	<u>E</u>
	<u>889</u>	<u>↓</u>	<u>S</u>
	<u>890</u>	<u>↓</u>	<u>W</u>



Plot Number: HDR6170_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR6170_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR6170_17 Description: Soil Date: 9/2/2017



Plot Number: HDR6170_17 Description: Soil Date: 9/2/2017

Archer Lat: N 59. 33228 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6172 -17Archer Long: W 154. 24258Wetland? ☒ Y-T ☐ N ☐ N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) M. Salway 2) E. Cunningham 3) —
 Bear Guard: Clyde Trehan Observer: —
 Do 'Normal Circumstances' Exist? ☒ YES ☐ NO
 Is the Site Significantly Disturbed (Atypical Situation)? ☒ YES ☐ NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? ☒ YES ☐ NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/2 /2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska

Subregion: Western/Interior

Field Map: 31 map date: 8/25Township: 103 Range: 29WSection: 6 S.M. Quad No.: 11B-4General Location (opt): —Site marked on map? ☒ Y

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Emp nig</u>	S	FAC	20			13. <u>Carex big</u>	H	FAC	15		
2. <u>Bet nan</u>	S	FAC	3			14. <u>Bistorta viv</u>	H	FAC	T		
3. <u>Vacc ulig</u>	S	FAC	30			15. <u>Cal can</u>	H	FAC	3		
4. <u>And pol</u>	S	FACW	5			16. <u>Carex macrocarpa</u>	H	FACW	7		
5. <u>Salix ret</u>	S	FAC	3			17. <u>Eri ang</u>	H	DBL	10		
6. <u>Alnus vir</u>	S	FAC	5			18. <u>Tri caes</u>	H	DBL	3		
7. <u>Salix pulchra</u>	S	FAC	5			19. <u>Eri sch</u>	H	DBL	15		
8. <u>Rho form</u>	S	FAC	3			20. <u>Water</u>	—		15		
9.						21.					
10.						22. lichen			10		
11.						23. moss (feather / sphagnum) <u>80</u>			60/20		
12.						24. bare ground					

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species <u>28</u>	X1= <u>28</u>
FACW species <u>12</u>	X2= <u>24</u>
FAC species <u>87</u>	X3= <u>261</u>
FACU species <u>—</u>	X4= <u>—</u>
UPL + NL species <u>—</u>	X5= <u>—</u>
Column Totals: <u>127</u> (A)	<u>313</u> (B)
Prevalence Index = B/A =	<u>2.46</u>

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)
S-74 H-53

Project Veg Type: DESTC ^{*see note}
 JDWet_Code: W
 ENWI Code: PSSLEMI/B/H
 Hydrophytic Vegetation Indicators
☒ Dominance Test is >50%
☒ Prevalence Index is ≤3.0
☒ Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
☒ Y ☐ N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

much of the moss is white. (~ 50% is white).
Veg type could also be DEST.H.
bottom of surface water ponds = calluses and/or organics

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? ☒ Y ☐ N
 Depth of Surface Water: 10"
 Water Table Present? ☒ Y ☐ N
 Depth to Water Table: 13"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y ☒ N
 If Y, depth to Layer —"
 Restrictive Layer Type —
 If lateral flow, at what depth? —"
 Saturated Soil Present? ☒ Y ☐ N
 Depth to saturation 7"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 6 (total)

☒ Y Surface Water (A1)
☒ Y High Water Table (A2)
☒ Y Saturation (A3)
☐ N Water Marks (B1)
☐ N Sediment Deposits (B2)
☐ N Drift Deposits (B3)
☐ N Algal Mat or Crust (B4)
☐ N Marl Deposits (B15)
☐ N Iron Deposits (B5)
☐ N Surface Soil Cracks (B6)
☐ Y Inundation Visible on Aerial Imagery (B7)
☐ N Sparsely Vegetated Concave Surface (B8)
☐ Y Hydrogen Sulfide Odor (C1)
☐ N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
 Other (explain in Hydrology Comments)

Secondary Indicators 2 (total)

☐ N Water-Stained Leaves (B9)
☐ N Drainage Patterns (B10)
☐ N Oxidized Rhizospheres on Living Roots (C3)
☐ Y Presence of Reduced Iron (C4)
☐ N Salt Deposits (C5)
☐ N Stunted or Stressed Plants (D1)
☐ N Geomorphic Position (D2)
☐ N Shallow Aquitard (D3) (≠ frost)
☐ N Micro-topographic Relief (D4)
☐ Y FAC-Neutral Test (D5)

Hydrology Comments: stream (last photopoint) borders poly to the sw.Aspect: SW (cardinal) Slope: 2 %HGM Class: Slope Landform: Footslope Local relief: concave / convex/ noneMacrotopo (in poly): flat Microtopo: large hummocksAre climatic/hydrologic conditions at the site typical for this time of year? ☒ Y ☐ N Unknown (Explain if N or Unknown)Wetland Hydrology?
☒ Y ☐ N

Soils

PLOT NO: HDR 6172-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: PD Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-4	Oi	—	—	—	—	—	—	—	—	—	—	—	
4-6	C(ash)	10YR 6/1	85	fine Silt	C	7.5YR 5/4	15	RC, PL	—	—	—	Y	
6-9	A	7.5YR 2.5/3	100	Silt	—	—	—	—	—	—	—	pos Y	
9-15	B ₁	2.5Y 4/2	100	fine Silt	—	—	—	—	—	—	—	Y	
15-18	B ₂	10YR 4/1	100	fine Sand	—	—	—	—	—	—	—	Y	mostly fine sand
18-20	Oeb	—	—	—	—	—	—	—	—	—	—	—	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Linings, M=Matrix

2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)

Primary Indicators

- ☒ N Histosol or Histel (A1)
- ☒ N Histic Epipedon (A2)
- ☒ Y Hydrogen Sulfide (A4)
- ☒ N Thick Dark Surface (A12)
- ☒ N Alaska Gleyed (A13)
- ☒ N Alaska Redox (A14)
- ☒ N Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ N Alaska Color Change (TA4)
- ☒ Alaska Alpine Swales (TA5)
- ☒ Alaska Redox with 2.5Y Hue (4a3)
- ☒ Alaska Gleyed w/out Hue 5Y or Redder Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic

Other Hydric Soil Situations (see pg 88-91)³

- ☒ N Soils with Low Organic Carbon Content (4b1)
- ☒ N Soils with Low Weatherable Iron Content (4b2)
- ☒ N Soil pH Greater than 7.2 (4b3)
- ☒ N Recently Developed Wetland (4b4)
- ☒ Y Positive α,α Test (60% of 4" layer) (4c)
- ☒ N Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments: water seeps in at HZS @ 12

Other Soil Observations:

Major Rooting Zone: 12 in.

Cryoturbated? Y ☒ N

Thixotropic? Y ☒ N

Hydric Soils?

☒ Y ☐ N

Wetland Determination

Hydrophytic Vegetation Present?

Wetland Hydrology Present?

Hydric Soils Present?

Plot Meets Wetland Criteria?

- ☒ Yes ☐ No
- ☒ Yes ☐ No
- ☒ Yes ☐ No
- ☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # MOSAMB1	894	SOIL	—
(4 veg photos in each direction, if different;	895	SOIL	—
2 soil photos: soil	896	veg	N
Profile and above pit)	897	↓	E
	898	↓	S
	899	↓	W



Plot Number: HDR6172_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR6172_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR6172_17 Description: Soil Date: 9/2/2017



Plot Number: HDR6172_17 Description: Soil Date: 9/2/2017

Archer Lat: N 59. 31971 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6177-17Archer Long: W 154. 14159Wetland? Y Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) Mac S. 2) Erin C. 3) —
 Bear Guard: Chad T. Observer: —
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/12/2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska

Subregion: Western/Interior

Field Map: 35 map date: 8/25Township: 10S Range: 29WSection: 10 S.M. Quad No.: ILIB-4General Location (opt): —Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Vib eda</u>	<u>S</u>	<u>FACU</u>	<u>16</u>			13. <u>Any luc</u>	<u>H</u>	<u>FACU</u>	<u>5</u>		
2. <u>Spl alax</u>	<u>S</u>	<u>FAC</u>	<u>40</u>			14. <u>Chl coh</u>	<u>H</u>	<u>FAC</u>	<u>80</u>		
3. <u>Pin vir</u>	<u>S</u>	<u>FAC</u>	<u>50</u>			15. <u>Her max</u>	<u>H</u>	<u>FACU</u>	<u>8</u>		
4. <u>Opl horr</u>	<u>S</u>	<u>FACU</u>	<u>5</u>			16. <u>Th cog</u>	<u>H</u>	<u>FAC</u>	<u>5</u>		
5.						17. <u>Gen mac</u>	<u>H</u>	<u>FAC</u>	<u>5</u>		
6.						18. <u>Spn pac</u>	<u>H</u>	<u>FACU</u>	<u>1</u>		
7.						19. <u>Chn ang</u>	<u>H</u>	<u>FACU</u>	<u>7</u>		
8.						20. <u>Rub arc</u>	<u>H</u>	<u>FAC</u>	<u>3</u>		
9.						21. <u>Egn arv</u>	<u>H</u>	<u>FAC</u>	<u>1</u>		
10. <u>Sen fri</u>	<u>H</u>	<u>FACU</u>	<u>1</u>			22. lichen			<u>—</u>		
11. <u>Heu gla</u>	<u>H</u>	<u>—</u>	<u>5</u>			23. moss (feather / sphagnum)			<u>5</u>		
12. <u>Epi lat</u>	<u>H</u>	<u>FAC</u>	<u>1</u>			24. bare ground / leaf litter			<u>15</u>		

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species — X1= —

FACW species — X2= —

FAC species 183 X3= 549

FACU species 35 X4= 140

UPL + NL species — X5= —

Column Totals: 218 (A) 689 (B)

Prevalence Index = B/A = 3.16

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

S-105 H-118

Project Veg Type: CAWTSJDWet Code: UENWI Code: U

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%☒ Prevalence Index is ≤3.0☒ Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

Y N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N
 Depth of Surface Water: —"

Water Table Present? Y N
 Depth to Water Table: 16"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐

Restrictive Layer w/in 24"? Y N
 If Y, depth to Layer —"
 Restrictive Layer Type —
 If lateral flow, at what depth? —"

Saturated Soil Present? Y N
 Depth to saturation 16"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
N High Water Table (A2)
N Saturation (A3)
— Water Marks (B1)
— Sediment Deposits (B2)
— Drift Deposits (B3)
— Algal Mat or Crust (B4)
— Marl Deposits (B15)
— Iron Deposits (B5)
— Surface Soil Cracks (B6)
— Inundation Visible on Aerial Imagery (B7)
— Sparsely Vegetated Concave Surface (B8)
— Hydrogen Sulfide Odor (C1)
— Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
N Other (explain in Hydrology Comments)

Secondary Indicators 2 (total)

N Water-Stained Leaves (B9)
Y Drainage Patterns (B10)
N Oxidized Rhizospheres on Living Roots (C3)
— Presence of Reduced Iron (C4)
— Salt Deposits (C5)
— Stunted or Stressed Plants (D1)
Y Geomorphic Position (D2)
N Shallow Aquitard (D3) (# frost)
N Micro-topographic Relief (D4)
N FAC-Neutral Test (D5)

Hydrology Comments:

Adjacent to stream. Multiple dry channels through area well drained river gravels.

Aspect: S (cardinal) Slope: 3 %Local relief: concave / convex / noneHGM Class: — Landform: Floodplain Macrotopo (in poly): concave Microtopo: UndulatingAre climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)

Wetland Hydrology?

Y N

Soils

PLOT NO: HDR 6177-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: SWPD

Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-1	Oi												
1-3	A	7.5YR 2.5/2	100	SIL									
3-9	C	var.	100	Coarse Sand									
9-19	C ₂	var.	100	Gsa/G									coarse sand & gravels

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α,α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:**Other Soil Observations:**Major Rooting Zone: 6 in.Cryoturbated? Y ☒ NThixotropic? Y ☒ N**Hydric Soils?**Y ☒ N**Wetland Determination**Hydrophytic Vegetation Present? ☒ Yes ☐ NoWetland Hydrology Present? ☒ Yes ☐ NoHydric Soils Present? ☒ Yes ☐ No

Plot Meets Wetland Criteria?

Yes Yes-Transitional ☒ No No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Mosambi</u>	<u>918</u>	<u>Soil</u>	<u>—</u>
(4 veg photos in each direction, if different;	<u>919</u>	<u>Soil</u>	<u>—</u>
2 soil photos: soil	<u>920</u>	<u>veg</u>	<u>N</u>
Profile and above pit)	<u>921</u>	<u> </u>	<u>E</u>
	<u>922</u>	<u> </u>	<u>S</u>
	<u>923</u>	<u>↓</u>	<u>W</u>



Plot Number: HDR6177_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR6177_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR6177_17 Description: Soil Date: 9/2/2017



Plot Number: HDR6177_17 Description: Soil Date: 9/2/2017

Archer Lat: N 59. 34821 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6181-17Archer Long: W 154. 53481Wetland? (Y) Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) M. Salway 2) E. Cunningham 3) _____
 Bear Guard: Chad J. Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/2/2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska

Subregion: Western/Interior

Field Map: 21 map date: 8/25Township: 95 Range: 31WSection: 32 S.M. Quad No.: Ilman B-5

General Location (opt): _____

Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collectn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
① <u>Vac ulig</u>	S	FAC	40			13. <u>Rubus cham</u>	H	FACW	3		
② <u>Eup arifum</u>	S	FAC	50			14. <u>Carex</u>	H				
3. <u>And pol</u>	S	FACW	8			⑤ <u>Equi an</u>	H	FAC	5		
4. <u>Vac vitus-idea</u>	S	FAC	15			16. <u>Ped sp.</u>	H		7		
5. <u>Bet nan</u>	S	FAC	15			⑦ <u>Gal can</u>	H	FAC	5		
6. <u>Salix pulcras</u>	S	FAC	20			⑧ <u>Carex big</u>	H	FAC	12		
7. <u>Rho tm</u>	S	FAC	15			19. <u>Equi scirpoides</u>	H	FAC	3		
8. <u>Salix ret</u>	S	FAC	5			20.					
9. <u>Arc rubra</u>	S	FAC	T			21.					
10.						22. lichen			15		
11.						23. moss (feather / sphagnum)			80		
12.						24. bare ground			T		

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species <u>—</u>	X1= <u>—</u>
FACW species <u>11</u>	X2= <u>22</u>
FAC species <u>196</u>	X3= <u>588</u>
FACU species <u>3</u>	X4= <u>12</u>
UPL + NL species <u>—</u>	X5= <u>—</u>
Column Totals: <u>210</u> (A)	<u>622</u> (B)
Prevalence Index = B/A = <u>2.96</u>	

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: <u>5</u> (A)
Total Number of Dominant Species Across All Strata: <u>5</u> (B)
Percent of Dominant Species That are OBL, FACW, or FAC: <u>100</u> (A/B)
<u>5-168</u> <u>H-78</u>

Project Veg Type: OWLSJDWet Code: WENWI Code: PSS3/1B

Hydrophytic Vegetation Indicators

X Dominance Test is >50%

X Prevalence Index is ≤3.0

— Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

(Y) N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

40% sphagnum
Very close to being OWLS - Changed from DEST to OWLS
after considering entire polygon.

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? (Y) N
 Depth of Surface Water: 10 "
 Water Table Present? (Y) N
 Depth to Water Table: 5 "
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer — "
 Restrictive Layer Type — "
 If lateral flow, at what depth? — "
 Saturated Soil Present? (Y) N
 Depth to saturation 2 "
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 3 (total)

Y Surface Water (A1)
Y High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
— Sediment Deposits (B2)
— Drift Deposits (B3)
— Algal Mat or Crust (B4)
— Marl Deposits (B15)
— Iron Deposits (B5)
— Surface Soil Cracks (B6)
— Inundation Visible on Aerial Imagery (B7)
— Sparsely Vegetated Concave Surface (B8)
N Hydrogen Sulfide Odor (C1)
— Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
 Other (explain in Hydrology Comments)

Secondary Indicators 2 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
Y Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (# frost)
N Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments: Open water under the willows 12" deepAspect: NW (cardinal) Slope: 2 %HGM Class: slope Landform: Depression Macrotopo (in poly): Concave Microtopo: moundsAre climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

(Y) N

Soils

PLOT NO: HDR 0181-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: VPD

Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Color(s)	Matrix (%)	Texture	Type ¹	Color	Redox Features (%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-5	Oi	—	—	—	—	—	—	—	—	—	—	—	—
5-8	C(ash)	10YR 6/2	BB	fin. SILT	C	10YR 4/4	1B	PLIRC, M	—	—	—	NEG	—
8-20	Oeb	—	—	—	—	—	—	—	—	—	—	—	—

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12 " from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

small cobbles s&A @ 10" bgs
 large gravel (90%)

Other Soil Observations:Major Rooting Zone: 10 in.Cryoturbated? Y (N)Thixotropic? Y (N)**Hydric Soils?**(Y) N**Wetland Determination**

Hydrophytic Vegetation Present?

(Yes) No

Wetland Hydrology Present?

(Yes) No

Hydric Soils Present?

(Yes) No

Plot Meets Wetland Criteria?

(Yes) Yes—Transitional No No—Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # <u>MSA 1001</u>	<u>937</u>	<u>SOIL</u>	—
(4 veg photos in each direction, if different;	<u>938</u>	<u>SOIL</u>	—
2 soil photos: soil	<u>939</u>	<u>veg</u>	<u>N</u>
Profile and above pit)	<u>940</u>	<u>↓</u>	<u>E</u>
	<u>941</u>	<u>↓</u>	<u>S</u>
	<u>942</u>	<u>↓</u>	<u>W</u>



Plot Number: HDR6181_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR6181_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR6181_17 Description: Soil Date: 9/2/2017



Plot Number: HDR6181_17 Description: Soil Date: 9/2/2017

Archer Lat: N 59. 34809 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6182-17Archer Long: W 154. 53444Wetland? Y Y-T (N) N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) M. Salway 2) E. Cunningham 3) _____
 Bear Guard: Clyde Trefon Observer: _____
 Do 'Normal Circumstances' Exist? YES NO
 Is the Site Significantly Disturbed (Atypical Situation)? YES NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? YES NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/12/2017
 County: Lake & Peninsula Borough/Kenai Borough
 State: Alaska Subregion: Western/Interior
 Field Map: 21 map date: 8/29/17
 Township: 9S Range: 31W
 Section: 32 S.M. Quad No.: Tliamna B-5
 General Location (opt): _____
 Site marked on map? Y

Vegetation Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collectn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
1. <u>Emp nigrum</u>	<u>S</u>	<u>FAC</u>	<u>60</u>			13. <u>Rubus chamaemorus</u>	<u>H</u>	<u>FACW</u>	<u>T</u>		
2. <u>Bet nana</u>	<u>S</u>	<u>FAC</u>	<u>3</u>			14. <u>Carex bigelowii</u>	<u>H</u>	<u>FAC</u>	<u>12</u>		
3. <u>Rho tom</u>	<u>S</u>	<u>FAC</u>	<u>10</u>			15. <u>Chamaenerion</u>	<u>H</u>	<u>FACU</u>	<u>T</u>		
4. <u>Salix reticulata</u>	<u>S</u>					16. <u>grasses sp.</u>	<u>H</u>	<u>—</u>	<u>3</u>		
5. <u>Arcto rubra (alpina)</u>	<u>S</u>	<u>FAC</u>	<u>5</u>			17.					
6. <u>Spirea stewartii</u>	<u>S</u>	<u>FACU</u>	<u>3</u>			18.					
7. <u>Salix pulchra</u>	<u>S</u>	<u>FAC</u>	<u>T</u>			19.					
8. <u>Vacc vit-idea</u>	<u>S</u>	<u>FAC</u>	<u>T</u>			20.					
9.						21.					
10.						22. lichen			<u>30</u>		
11.						23. moss (feather / sphagnum)			<u>10</u>		
12.						24. bare ground			<u>0</u>		

Prevalence Index worksheet:

Total % Cover of _____ Multiply by:

OBL species — X1= —
 FACW species — X2= —
 FAC species 90 X3= 270
 FACU species 3 X4= 12
 UPL + NL species — X5= —
 Column Totals: 93 (A) 282 (B)
 Prevalence Index = B/A= 3.03

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 67 (A/B)
S-81 H-15

Project Veg Type: DEST
 JDWet Code: U
 ENWI Code: U
 Hydrophytic Vegetation Indicators
 X Dominance Test is >50%
 — Prevalence Index is ≤3.0
 — Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?
Y N

¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? Y N
 Depth of Surface Water: —"
 Water Table Present? Y N
 Depth to Water Table: —"
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐
 Restrictive Layer w/in 24"? Y N
 If Y, depth to Layer —"
 Restrictive Layer Type —
 If lateral flow, at what depth? —"
 Saturated Soil Present? Y N
 Depth to saturation —"
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 0 (total)

N Surface Water (A1)
— High Water Table (A2)
— Saturation (A3)
— Water Marks (B1)
— Sediment Deposits (B2)
— Drift Deposits (B3)
— Algal Mat or Crust (B4)
— Marl Deposits (B15)
— Iron Deposits (B5)
— Surface Soil Cracks (B6)
— Inundation Visible on Aerial Imagery (B7)
— Sparsely Vegetated Concave Surface (B8)
— Hydrogen Sulfide Odor (C1)
— Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
— Other (explain in Hydrology Comments)

Secondary Indicators 0 (total)

1 Water-Stained Leaves (B9)
1 Drainage Patterns (B10)
1 Oxidized Rhizospheres on Living Roots (C3)
1 Presence of Reduced Iron (C4)
1 Salt Deposits (C5)
1 Stunted or Stressed Plants (D1)
1 Geomorphic Position (D2)
1 Shallow Aquitard (D3) (≠ frost)
1 Micro-topographic Relief (D4)
1 FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: NW (cardinal) Slope: 3 %HGM Class: — Landform: WillowLocal relief: concave / convex / noneMacrotopo (in poly): Concave Microtopo: Small

Wetland Hydrology?

Are climatic/hydrologic conditions at the site typical for this time of year? Y N Unknown (Explain if N or Unknown)Y N

Soils

PLOT NO: HDR 6182-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: WD

Indicators of possible andic properties: smeary / low bulk density

Soil Profile Description: Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α-α (Y, N; >30 sec)	Horizon Comments
0-2	Oi	—	—	—	—	—	—	—	—	—	—	—	—
2-3	C-ash	10YR 6/1	100	Fine Silt	—	—	—	—	—	—	—	—	—
3-4	Dib	—	—	—	—	—	—	—	—	—	—	—	—
4-5	E	2.5Y 5/2	100	Sal	—	—	—	—	—	—	—	—	—
5-8	A	5YR 2.5/1	100	Sal	—	—	—	—	—	—	—	—	—
8-11	B ₁	7.5YR 2.5/3	100	Sal	—	—	—	—	—	—	—	—	—
11-16	B ₂	10YR 3/3	100	Sal	—	—	—	—	—	—	—	NEG-N	—
REFUSAL - LARGE ROCK/BOULDER													20% gravels

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☐ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
☐ Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☐ Soils with Low Weatherable Iron Content (4b2)
☐ Soil pH Greater than 7.2 (4b3)
☐ Recently Developed Wetland (4b4)
☒ Positive α_a Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ ≤ 12" from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:**Other Soil Observations:**Major Rooting Zone: 6 in.Cryoturbated? Y ☒ NThixotropic? Y ☒ N**Hydric Soils?**Y ☒ N**Wetland Determination**Hydrophytic Vegetation Present? ☒ Yes ☒ NoWetland Hydrology Present? ☒ Yes ☒ NoHydric Soils Present? ☒ Yes ☒ No

Plot Meets Wetland Criteria?

Yes ☒ Yes-Transitional ☒ No ☒ No-Transitional**Remarks:**

Archer #	Photo #	Subject	Bearing
Ricoh # <u>MOSAMBI</u>	<u>943</u>	<u>SOIL</u>	<u>—</u>
(4 veg photos in each direction, if different;	<u>944</u>	<u>SOIL</u>	<u>—</u>
2 soil photos: soil	<u>945</u>	<u>veg</u>	<u>N</u>
Profile and above pit)	<u>946</u>	<u>↓</u>	<u>E</u>
	<u>947</u>	<u>↓</u>	<u>S</u>
	<u>948</u>	<u>↓</u>	<u>W</u>



Plot Number: HDR6182_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR6182_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR6182_17 Description: Soil Date: 9/2/2017



Plot Number: HDR6182_17 Description: Soil Date: 9/2/2017

Archer Lat: N 59. 33245 GPS datum: NAD83

Wetland Determination Form

PLOT: HDR 6186-17Archer Long: W 154. 42856Wetland? (Y) Y-T N N-T

Project/Site: Pebble Project Applicant: Pebble Limited Partnership
 Investigator: 1) M. Salway 2) E. Cunningham 3) _____
 Bear Guard: Clude Trefon Observer: _____
 Do 'Normal Circumstances' Exist? (YES) NO
 Is the Site Significantly Disturbed (Atypical Situation)? (YES) NO
 (Indicators altered due to human acts or natural events) Veg Soil Hydro
 Is the Area a Potential Problem Area? (YES) NO
 (Naturally Problematic/Indicators difficult due to normal seasonal variations) Veg Soil Hydro

Date: 9/12/2017

County: Lake & Peninsula Borough/Kenai Borough

State: Alaska

Subregion: Western/Interior

Field Map: 24 map date: 8/25Township: 10S Range: 31WSection: 1 S.M. Quad No.: 211mm B-4

General Location (opt): _____

Site marked on map? Y

Vegetation

Trace (T): <3 percent. P: Present in polygon but not plot. E: On edge (outside) of plot and noteworthy. 37.5' radius circular plot unless noted.

Tree-form plant is in Tree stratum if >3" dbh, in Sapling/Shrub stratum if <3" dbh. Herbs ≠ woody.

Species (circle 50/20/20 dominants) © for collexn	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)	Species (circle 50/20/20 dominants) also water, rock, snags	Stratum	Ind. Stat	% Abs Cov	Tree/Shrub Ht (ft)	DBH (in)
① <u>Emp nigrum</u>	S	FAC	20			⑬ <u>Tri caes</u>	H	OBL	65		
② <u>Vac ulig</u>	S	FAC	12			14. <u>Carex SAX</u>	H	FACW	15		
3. <u>And pol</u>	S	FACW	3			⑮ <u>Geum calthae</u>	H	FACW	25		
4. <u>Bet nran</u>	S	FAC	5			16. <u>Erig per</u>	H	FACW	8		
5. <u>Athrus vir</u>	S	FAC	3			17. <u>Cat can</u>	H	FAC	3		
6. <u>Salix pulcr</u>	S	FAC	3			18. <u>Junco cast</u>	H	FACW	5		
7. <u>Vac ovalifolium</u>	S	FAC	T			19. <u>Carex big</u>	H	FAC	15		
8. <u>Salix bar</u>	S	FAC	T			20. <u>Agro scabra</u>	H	FAC	5		
9. <u>Eri ang</u>	H	OBL	3			21. <u>Cornus seuc</u>	H	FAC	T		
10. <u>Viola sp</u>	H	FAC	T			22. lichen			3		
11. <u>Sarg. can</u>	H	FACW	5			23. <u>moss (feather / sphagnum)</u>					
12. <u>Artemisia sp</u>	H		T			24. bare ground					

Prevalence Index worksheet:

Total % Cover of _____ Multiply by:

OBL species 68 X1= 68
 FACW species 61 X2= 122
 FAC species 64 X3= 198
 FACU species — X4= —
 UPL + NL species — X5= —
 Column Totals: 195 (A) 388 (B)
 Prevalence Index = B/A= 1.99

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)
5-46 H-149

Project Veg Type: OMSSTJDWet Code: WENWI Code: PSS3/EMIC

Hydrophytic Vegetation Indicators

X Dominance Test is >50%
X Prevalence Index is ≤3.0
— Problematic Hydr. Veg¹ (see pg. 84 in 2007 Manual and explain)

Hydrophytic Vegetation?

(Y) N¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic

Vegetation Comments:

5-finger slash H OBL I Gentia plat H = I
Comp
grass (high) H = I grass base H = I
SPA

Hydrology

Observations (Measured from grnd surface):

Surface Water Present? (Y) N
 Depth of Surface Water: 2"
 Water Table Present? (Y) N
 Depth to Water Table: 17" seeping
 Just seeping in at this level, not yet filled to this level? (check if yes) ☐ 13"
 Restrictive Layer w/in 24"? Y (N)
 If Y, depth to Layer _____
 Restrictive Layer Type _____
 If lateral flow, at what depth? _____
 Saturated Soil Present? (Y) N
 Depth to saturation 0" surface
 Epi Endo Unknown (circle type of sat.)

2007 AK Supplement Hydrology Indicators (Measure from ground surface)

Primary Indicators 3 (total)

Y Surface Water (A1)
N High Water Table (A2)
Y Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Marl Deposits (B5)
N Iron Deposits (B5)
N Surface Soil Cracks (B6)
N Inundation Visible on Aerial Imagery (B7)
N Sparsely Vegetated Concave Surface (B8)
Y Hydrogen Sulfide Odor (C1)
N Dry-Season Water Table (C2) (mid May-July: H₂O w/in 24" min. soil or H₂O w/in 40" org. soil)
— Other (explain in Hydrology Comments)

Secondary Indicators 2 (total)

N Water-Stained Leaves (B9)
N Drainage Patterns (B10)
Y Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3) (≠ frost)
N Micro-topographic Relief (D4)
Y FAC-Neutral Test (D5)

Hydrology Comments:

Aspect: E (cardinal) Slope: 15%
 HGM Class: slope Landform: foot slope Local relief: concave/convex/none
 Macrotopo (in poly): plateau Microtopo: tussocks
 Are climatic/hydrologic conditions at the site typical for this time of year? (Y) N Unknown (Explain if N or Unknown)

Wetland Hydrology?

(Y) N

Soils

PLOT NO: HDR 6186-17

Soil Survey Map Unit: Exp Soil Survey of AK Field Drainage Class: PD Indicators of possible andic properties: smeary / low bulk density**Soil Profile Description:** Measure Histosol depth from grnd surface (0-2 Oi, 2-20 Oe... Measure mineral soil depth from top of mineral; e.g., 8-4 Oi, 4-0 Oe, 0-2 A1, 2-6 Bw... Colors Moist Unless Otherwise Noted.

Depth (Inches)	Horizon Name	Matrix Color(s)	(%)	Texture	Type ¹	Color	(%)	Loc ²	Abund. (f, c, m)	Size (f, m, c)	Contrast (f, d, p)	α - α (Y, N; >30 sec)	Horizon Comments
0-3	Oi												
3-3.5	C(wh)	10YR 7/1	90	fine Silty	C	10YR 4/6	10	PLRC			neg		
3.5-9	Oeb												
9-9.5	(B _h)	10YR 3/2	100	Sil							neg		
9.5-13.5	Oeb												
13.5-16.5	B ₂	2.5Y 4/3	80	fine SaL	C	7.5YR 4/4	20	PLRC			neg		
16.5-21.5	Oeb												

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Linings, M=Matrix**2007 AK Supplement Hydric Soil Indicators and Other Situations (if one or more indicators or other situations are present then soil is hydric)****Primary Indicators**

- ☒ Histosol or Histel (A1)
☒ Histic Epipedon (A2)
☒ Hydrogen Sulfide (A4)
☒ Thick Dark Surface (A12)
☒ Alaska Gleyed (A13)
☒ Alaska Redox (A14)
☒ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³

- ☒ Alaska Color Change (TA4)
☒ Alaska Alpine Swales (TA5)
☒ Alaska Redox with 2.5Y Hue (4a3)
☒ Alaska Gleyed w/out Hue 5Y or Redder
 Underlying layer (4a4)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology and appropriate landscape position must be present unless disturbed or problematic**Other Hydric Soil Situations (see pg 88-91)³**

- ☒ Soils with Low Organic Carbon Content (4b1)
☒ Soils with Low Weatherable Iron Content (4b2)
☒ Soil pH Greater than 7.2 (4b3)
☒ Recently Developed Wetland (4b4)
☒ Positive α , α Test (60% of 4" layer) (4c)
☒ Soil determined to be ponded, flooded, H₂O Table @ $\leq 12"$ from surface for ≥ 14 consecutive days during growing season (4d)

Soil Comments:

H2S @ 0"

Other Soil Observations:Major Rooting Zone: 10 in.Cryoturbated? Y ☒ NThixotropic? Y ☒ N**Hydric Soils?**☒ N**Wetland Determination**Hydrophytic Vegetation Present? ☒ Yes ☐ NoWetland Hydrology Present? ☒ Yes ☐ NoHydric Soils Present? ☒ Yes ☐ NoPlot Meets Wetland Criteria? ☒ Yes ☐ Yes-Transitional ☐ No ☐ No-Transitional

Remarks:

Archer #	Photo #	Subject	Bearing
Ricoh # <u>Mosambi</u>	<u>962</u>	<u>Soil</u>	
(4 veg photos in each direction, if different;	<u>963</u>	<u>Soil</u>	
2 soil photos: soil	<u>964</u>	<u>veg</u>	<u>N</u>
Profile and above pit)	<u>965</u>	<u>↓</u>	<u>E</u>
	<u>966</u>	<u>↓</u>	<u>S</u>
	<u>967</u>	<u>↓</u>	<u>W</u>

MS 9/11/17



Plot Number: HDR6186_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR6186_17 **Description:** Vegetation **Date:** 9/2/2017



Plot Number: HDR6186_17 Description: Soil Date: 9/2/2017



Plot Number: HDR6186_17 Description: Soil Date: 9/2/2017

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/19/2018
 Applicant/Owner: PLP Sampling Point: HDR1000_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): None Slope(%): 3 HGM: Slope
 Subregion (LRR): X Lat: 59.888027 Long: -155.438635 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/EM1B

Vegetation Type: Ericaceous Shrub Bog (ESB)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Vaccinium uliginosum</u>	35	Yes	FAC	OBL species <u>3</u> x1= <u>3</u>
2. <u>Empetrum nigrum</u>	30	Yes	FAC	FACW species <u>23</u> x2= <u>46</u>
3. <u>Betula nana</u>	20	No	FAC	FAC species <u>133</u> x3= <u>399</u>
4. <u>Andromeda polifolia</u>	10	No	FACW	FACU species <u> </u> x4= <u> </u>
5. <u>Salix pulchra</u>	5	No	FAC	UPL species <u> </u> x5= <u> </u>
6. <u>Vaccinium vitis-idaea</u>	5	No	FAC	Column Totals: <u>159</u> (A) <u>448</u> (B)
Total Cover: <u>108</u>				<u>Prevalence Index = B/A=</u> <u>2.82</u>
50% of total cover: <u>54</u>				Hydrophytic Vegetation Indicators:
20% of total cover: <u>21.6</u>				<u>X</u> Dominance Test is >50%
<u>Herb Stratum</u>				<u>X</u> Prevalence Index is ≤3.0
1. <u>Carex bigelowii</u>	30	Yes	FAC	<u> </u> Morphological Adaptations ¹ (Provide
2. <u>Rubus chamaemorus</u>	10	No	FACW	data in Remarks or on a separate sheet)
3. <u>Calamagrostis canadensis</u>	5	No	FAC	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
4. <u>Petasites frigidus s.l.</u>	3	No	FACW	
5. <u>Eriophorum angustifolium</u>	3	No	OBL	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>51</u>				
50% of total cover: <u>25.5</u>				
20% of total cover: <u>10.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>45</u>		% Cover of Bryophytes <u>45</u>		
(Where applicable)				

Remarks: ESB

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4							N/A		hor:Oi
4-14							N/A		hor:Oe
14-20							N/A		hor:Oa

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: <input type="text"/> None Depth (inches): <input type="text"/> Field Drainage Class: <input type="text"/> PD - Poorly Drained	Hydric Soil Present? Yes <input type="text"/> <input checked="" type="text"/> No <input type="text"/>
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="text"/> No <input checked="" type="text"/> Depth (inches): <input type="text"/> Water Table Present? Yes <input checked="" type="text"/> No <input type="text"/> Depth (inches): <input type="text"/> 3.0 Saturation Present? Yes <input checked="" type="text"/> No <input type="text"/> Depth (inches): <input type="text"/> 0.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="text"/> <input checked="" type="text"/> No <input type="text"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Plot located at toeslope. Hummocks microtopography.

Geomorphic Position: Toeslope

Additional Reference Data: Overflow Vegetation

HDR1000_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Ledum decumbens	3	No	FAC

Additional Reference Data: Photos

HDR1000_18



Photo Name: Photo_180619100751



Photo Name: Photo_180619103140



Photo Name: Photo_180619100740



Photo Name: Photo_180619100806



Photo Name: Photo_180619100819



Photo Name: Photo_180619103131

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/19/2018</u>
Applicant/Owner: <u>PLP</u>		Sampling Point: <u>HDR1001_18</u>
Investigators: <u>ZH TP</u>	Landform (hillslope, terrace, etc.): <u>Terrace</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>2</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.888618</u>	Long: <u>-155.439390</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
	NWI Classification: <u>U</u>	

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	
Hydric Soil Present? Yes <u> </u> No <u>X</u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		Yes <u> </u> No <u>X</u>
Remarks: Wetter than normal antecedent precipitation.		

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
	Total Cover: <u> </u>			Percent of Dominant Species
	50% of total cover: <u>0</u>	20% of total cover: <u>0</u>		That Are OBL, FACW, or FAC: <u>67</u> (A/B)
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>90</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix pulchra</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FACW species <u>1</u> x2= <u>2</u>
4. <u>Vaccinium uliginosum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FAC species <u>114</u> x3= <u>342</u>
5. <u>Loiseleuria procumbens</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	FACU species <u>21</u> x4= <u>84</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
	Total Cover: <u>104</u>			Column Totals: <u>136</u> (A) <u>428</u> (B)
	50% of total cover: <u>52</u>	20% of total cover: <u>20.8</u>		<u>Prevalence Index = B/A=</u> <u>3.15</u>
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Anemone narcissiflora</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Carex bigelowii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Rhodiola integrifolia</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Angelica lucida</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sanguisorba canadensis</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
	Total Cover: <u>32</u>			
	50% of total cover: <u>16</u>	20% of total cover: <u>6.4</u>		
Plot size (radius, or length x width) <u>1/10 acre</u>		% Bare Ground <u>0</u>		
% Cover of Wetland Bryophytes <u> </u>		% Cover of Bryophytes <u> </u>		
(Where applicable)				
Remarks: DEST-H				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3							N/A		hor:Oe
3-11	7.5YR 3/2	100					No	Silt Loam	hor:A/B
11-18	10YR 4/4	100					No	Sandy Loam	hor:B/C Gravelly Loam

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: <input type="checkbox"/> None Depth (inches): _____ Field Drainage Class: <input type="checkbox"/> MWD - Moderately Well Drained	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
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Remarks: No hydric soil indicators observed, alpha alpha negative.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <input type="checkbox"/> 2.0 Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <input type="checkbox"/> 1.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <input type="checkbox"/> 0.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Recent heavy rains. Emp nig in bottoms of hummocks inundated.

Geomorphic Position: Terrace above stream below toeslope.



Photo Name: Photo_180619115346



Photo Name: Photo_180619115308



Photo Name: Photo_180619115356

Additional Reference Data: Photos

HDR1001_18



Photo Name: Photo_180619115326



Photo Name: Photo_180619115318



Photo Name: Photo_180619115335

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/19/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1003_18</u>	
Investigators: <u>ZH TP</u>	Landform (hillslope, terrace, etc.): <u>Footslope</u>	
Local Relief (concave, convex, none): <u>Convex</u>	Slope(%): <u>10</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.888618</u>	Long: <u>-155.442920</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Bluejoint Herb (BH)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: Small polygon, plot representative of entire polygon. Wetter than normal antecedent precipitation.	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67</u> (A/B)
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
Sapling/Shrub Stratum				Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: <u> </u> OBL species <u> </u> x1= <u> </u> FACW species <u>8</u> x2= <u>16</u> FAC species <u>66</u> x3= <u>198</u> FACU species <u>26</u> x4= <u>104</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>100</u> (A) <u>318</u> (B) Prevalence Index = B/A= <u>3.18</u>
1. <u>Betula nana</u>	<u>3</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Spiraea stevenii</u>	<u>3</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Vaccinium uliginosum</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>7</u>				
50% of total cover: <u>3.5</u>		20% of total cover: <u>1.4</u>		
Herb Stratum				Hydrophytic Vegetation Indicators: X Dominance Test is >50% Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Calamagrostis canadensis</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Epilobium angustifolium</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	
3. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
4. <u>Rubus stellatus</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
5. <u>Angelica lucida</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
6. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
7. <u>Pyrola sp.</u>	<u>5</u>	<u>No</u>	<u>N/A</u>	
8. <u>Geranium erianthum</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
9. <u>Lupinus arcticus</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
10. <u>Viola langsdoeffii</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>98</u>				
50% of total cover: <u>49</u>		20% of total cover: <u>19.6</u>		
Plot size (radius, or length x width) <u>10 ft</u>		% Bare Ground <u>0</u>		
% Cover of Wetland Bryophytes <u> </u>		% Cover of Bryophytes <u> </u>		
(Where applicable)				
Remarks: BH				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-5							N/A	Organic	hor:Oe
5-11	7.5YR 3/2	100					No	Loam	hor:A
11-16	10YR 5/4	100					No	Loam	hor:B/C Gravelly Loam
16-23	10YR 4/4	95	5YR 4/6	5	C	M	No	Loam	hor:B/C Gravelly Loam

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:
☐ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:
☐ Alaska Color Change (TA4)⁴
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox With 2.5Y Hue

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

☐ Alaska Gleyed Without Hue 5Y or Redder
☐ Underlying Layer
☐ Other (Explain in Remarks)

Restrictive Layer (if present):
Type: None
Depth (inches): _____
Field Drainage Class: MWD - Moderately Well Drained

Hydric Soil Present? Yes ☐ No ☒ X

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)
☐ Surface Water (A1) ☐ Inundation Visible on Aerial Imagery (B7)
☐ High Water Table (A2) ☐ Sparsely Vegetated Concave Surface (B8)
☐ Saturation (A3) ☐ Marl Deposits (B15)
☐ Water Marks (B1) ☐ Hydrogen Sulfide Odor (C1)
☐ Sediment Deposits (B2) ☐ Dry Season Water Table (C2)
☐ Drift Deposits (B3) ☐ Other (Explain in Remarks)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)

Secondary Indicators (2 or more required)
☐ Water-stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ Microtopographic Relief (D4)
☐ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ☐ No ☒ X Depth (inches): _____
Water Table Present? Yes ☒ X No ☐ Depth (inches): 18.0
Saturation Present? Yes ☒ X No ☐ Depth (inches): 14.0
(includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒ X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Heavy recent rains. Plot located approx 10 to 15 feet above creek, no indications of over bank flooding at this location.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1003_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Sedum rosea ssp. integrifolium	1	No	FAC
Veratrum viride	1	No	FAC
Geocaulon lividum	1	No	FACU
Polygonum bistorta ssp. plumosum	1	No	FACU

Additional Reference Data: Photos

HDR1003_18



Photo Name: Photo_180619130823



Photo Name: Photo_180619130714



Photo Name: Photo_180619130837



Photo Name: Photo_180619130803



Photo Name: Photo_180619130723



Photo Name: Photo_180619130752

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/19/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1004_18</u>	
Investigators: <u>ZH TP</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>10</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.888596</u>	Long: <u>-155.448636</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Bluejoint Herb (BH)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Small polygon, plot representative of entire polygon. Checked soils 45 feet south of plot = same. Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>1</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>2</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>50</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Spiraea stevenii</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>15</u> x2= <u>30</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>76</u> x3= <u>228</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>25</u> x4= <u>100</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>5</u>				Column Totals: <u>116</u> (A) <u>358</u> (B)
50% of total cover: <u>2.5</u>				<u>Prevalence Index = B/A=</u> <u>3.09</u>
20% of total cover: <u>1</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>65</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test is >50%
2. <u>Veratrum viride</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Epilobium angustifolium</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
5. <u>Geranium erianthum</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Viola langsdorffii</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
7. <u>Angelica lucida</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Rubus stellatus</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Geocaulon lividum</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
10. <u>Heracleum maximum</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>114</u>				
50% of total cover: <u>57</u>				
20% of total cover: <u>22.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks: <u>BH</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-10	10YR 2/2	100					No	Silt Loam	hor:A
10-20	7.5YR 2.5/3	100					No	Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: WD - Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
(includes capillary fringe)	
	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary or secondary indicators observed. Soil profile moist throughout but not saturated.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1004_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Artemisia sp	1	No	N/A
Carex sp.	1	No	N/A
Festuca sp.	1	No	N/A

Additional Reference Data: Photos

HDR1004_18



Photo Name: Photo_180619141552



Photo Name: Photo_180619141623



Photo Name: Photo_180619141606



Photo Name: Photo_180619141544



Photo Name: Photo_180619141657



Photo Name: Photo_180619141651

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/19/2018
 Applicant/Owner: PLP Sampling Point: HDR1006_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 10 HGM: N/A
 Subregion (LRR): X Lat: 59.888424 Long: -155.450491 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>			
Remarks: <u>Small polygon. Plot representative of entire polygon. Wetter than normal antecedent precipitation.</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>6</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>67</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Vaccinium uliginosum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium vitis-idaea</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
4. <u>Alnus sinuata</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>129</u> x3= <u>387</u>
5. <u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	FACU species <u>14</u> x4= <u>56</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u>1</u> x5= <u>5</u>
Total Cover: <u>120</u>				Column Totals: <u>144</u> (A) <u>448</u> (B)
50% of total cover: <u>60</u>				Prevalence Index = B/A= <u>3.11</u>
20% of total cover: <u>24</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>3</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Geocaulon lividum</u>	<u>3</u>	<u>Yes</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Gymnocarpium dryopteris</u>	<u>3</u>	<u>Yes</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Veratrum viride</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Epilobium angustifolium</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
7. <u>Lycopodium annotinum s.l.</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
8. <u>Streptopus amplexifolius</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
9. <u>Carex sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	
10. <u>Hierochloe odorata</u>	<u>1</u>	<u>No</u>	<u>NL</u>	
Total Cover: <u>25</u>				
50% of total cover: <u>12.5</u>				
20% of total cover: <u>5</u>				
Plot size (radius, or length x width) <u>20 ft</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u> </u>				
% Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks: <u>DEST-H</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-4									hor:Oe
4-9	10YR 2/1	100					No	Silt Loam	hor:A
9-20	7.5YR 3/3	100					No	Silt Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: <input type="checkbox"/> None Depth (inches): _____ Field Drainage Class: <input type="checkbox"/> WD - Well Drained	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
--	---

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Profile moist but not saturated. No hydrology indicators observed. Well drained site.

Geomorphic Position:

Additional Reference Data: Photos

HDR1006_18



Photo Name: Photo_180619150540

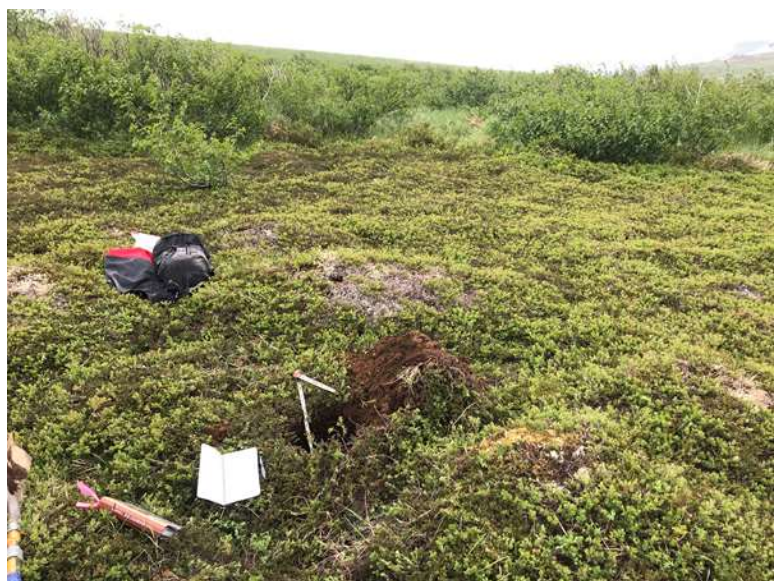


Photo Name: Photo_180619150503



Photo Name: Photo_180619150521

Photo Name: Photo_180619150559



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/20/2018
 Applicant/Owner: PLP Sampling Point: HDR1007_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 10 HGM: N/A
 Subregion (LRR): X Lat: 59.904125 Long: -155.426158 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Dwarf Birch Shrub (ODBS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Betula nana</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Empetrum nigrum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
3. <u>Vaccinium uliginosum</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FAC species <u>114</u> x3= <u>342</u>
4. <u>Ledum decumbens</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACU species <u>5</u> x4= <u>20</u>
5. <u>Salix pulchra</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
6. <u>Vaccinium vitis-idaea</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	Column Totals: <u>119</u> (A) <u>362</u> (B)
Total Cover: <u>91</u>				<u>Prevalence Index = B/A=</u> <u>3.04</u>
50% of total cover: <u>45.5</u>				
20% of total cover: <u>18.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Polygonum bistorta ssp. plumosum</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Rubus arcticus s.l.</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>28</u>				
50% of total cover: <u>14</u>				
20% of total cover: <u>5.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>5</u>				Yes <u>X</u> No <u> </u>
(Where applicable)				Present?

Remarks:
 ODBS.
 5% sphagnum.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-13	10YR 3/2	100					No	Silt Loam	hor:A 30% Small Cobble
13-23	10YR 4/4	100					No	Sandy Loam	hor:B/C Frost Lens From 13 To 17

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: Seasonal Frost Lens, Temporary					
Depth (inches):					
Field Drainage Class: MWD - Moderately Well Drained					

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	X	No
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
Water Table Present? Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):	15.0			
Saturation Present? Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):	7.0			
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water perched on frost lens seeping into pit. Soil below lens was moist but not saturated until water seeped in. Heavy recent rains.

Geomorphic Position:



Photo Name: Photo_180620083255



Photo Name: Photo_180620083244



Photo Name: Photo_180620083322



Photo Name: Photo_180620083234



Photo Name: Photo_180620083307



Photo Name: Photo_180620083332

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/20/2018
 Applicant/Owner: PLP Sampling Point: HDR1008_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 8 HGM: Slope
 Subregion (LRR): X Lat: 59.903982 Long: -155.425763 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/3B

Vegetation Type: Open Dwarf Birch – Ericaceous Shrub Bog (ODBESB)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Vaccinium uliginosum</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Betula nana</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>2</u> x2= <u>4</u>
3. <u>Empetrum nigrum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	FAC species <u>129</u> x3= <u>387</u>
4. <u>Salix pulchra</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACU species <u> </u> x4= <u> </u>
5. <u>Ledum decumbens</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
6. <u>Vaccinium vitis-idaea</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	Column Totals: <u>131</u> (A) <u>391</u> (B)
Total Cover: <u>101</u>				<u>Prevalence Index = B/A=</u> <u>2.98</u>
50% of total cover: <u>50.5</u>				Hydrophytic Vegetation Indicators:
20% of total cover: <u>20.2</u>				<u>X</u> Dominance Test is >50%
<u>Herb Stratum</u>				<u>X</u> Prevalence Index is ≤3.0
1. <u>Carex bigelowii</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
2. <u>Rubus arcticus s.l.</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
3. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
4. <u>Pedicularis langsдорфii</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
5. <u>Petasites frigidus s.l.</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>30</u>				
50% of total cover: <u>15</u>				
20% of total cover: <u>6</u>				
Plot size (radius, or length x width) <u>10 ft</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>65</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u> </u>				Present?
(Where applicable)				

Remarks:
ODBESB.
More sphagnum than 1007.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-10									hor:Oe
10-22	10YR 2/2	100					No	Silt Loam	hor:A 5% Small Cobble

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type: None			Yes	<input checked="" type="checkbox"/> X	No
Depth (inches):					
Field Drainage Class: PD - Poorly Drained					

Remarks: No frost lens.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> X Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> X FAC-Neutral Test (D5)	

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):		Yes	<input checked="" type="checkbox"/> X
Water Table Present?	Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):	5.0	No	
Saturation Present?	Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):	2.0		
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:



Photo Name: Photo_180620093520



Photo Name: Photo_180620093602



Photo Name: Photo_180620093646



Photo Name: Photo_180620093619



Photo Name: Photo_180620093532



Photo Name: Photo_180620093640

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/20/2018
 Applicant/Owner: PLP Sampling Point: HDR1009_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 5 HGM: Slope
 Subregion (LRR): X Lat: 59.904116 Long: -155.426704 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/3B

Vegetation Type: Open Dwarf Birch – Ericaceous Shrub Bog (ODBESB)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Prevalence Index worksheet:				
<u>Sapling/Shrub Stratum</u>		Total % Cover of: <u> </u> Multiply by:		
1. <u>Betula nana</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Empetrum nigrum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>10</u> x2= <u>20</u>
3. <u>Vaccinium uliginosum</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FAC species <u>120</u> x3= <u>360</u>
4. <u>Ledum decumbens</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACU species <u> </u> x4= <u> </u>
5. <u>Andromeda polifolia</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	UPL species <u> </u> x5= <u> </u>
6. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Column Totals: <u>130</u> (A) <u>380</u> (B)
Total Cover: <u>95</u>				
50% of total cover: <u>47.5</u>				Prevalence Index = B/A= <u>2.92</u>
20% of total cover: <u>19</u>				
Hydrophytic Vegetation Indicators:				
1. <u>Carex bigelowii</u>				<u>X</u> Dominance Test is >50%
2. <u>Rubus arcticus s.l.</u>				<u>X</u> Prevalence Index is ≤3.0
3. <u> </u>				Morphological Adaptations ¹ (Provide
4. <u> </u>				data in Remarks or on a separate sheet)
5. <u> </u>				Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>				
7. <u> </u>				
8. <u> </u>				
9. <u> </u>				
10. <u> </u>				
Total Cover: <u>35</u>				
50% of total cover: <u>17.5</u>				
20% of total cover: <u>7</u>				
Plot size (radius, or length x width) <u>10 ft</u>				
% Bare Ground <u>10</u>				
% Cover of Wetland Bryophytes <u>35</u>				
% Cover of Bryophytes <u> </u>				
(Where applicable)				
Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>				

Remarks:
ODBESB.
35% sphagnum.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-12									hor:Oe
12-21	10YR 3/2	100					No	Sandy Loam	hor:A 10% Small Cobble
21-23	10YR 4/6	100					No	Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> No
Type: None				
Depth (inches):				
Field Drainage Class: PD - Poorly Drained				

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> No
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):			
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	14.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	8.0		
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position: Bench on slope.

Additional Reference Data: Overflow Vegetation

HDR1009_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>

Additional Reference Data: Photos

HDR1009_18



Photo Name: Photo_180620102417



Photo Name: Photo_180620102350

Additional Reference Data: Photos

HDR1009_18



Photo Name: Photo_180620102442



Photo Name: Photo_180620102342



Photo Name: Photo_180620102435



Photo Name: Photo_180620102403

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/20/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1010_18</u>	
Investigators: <u>ZH TP</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>8</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.909204</u>	Long: <u>-155.443649</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Closed Alder – Willow Tall Shrub (CAWTS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	

Remarks: Small polygon, plot representative of entire polygon. Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover:	<u> </u>			
50% of total cover:	<u>0</u>	20% of total cover:	<u>0</u>	Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: <u> </u> OBL species <u> </u> x1= <u> </u> FACW species <u>3</u> x2= <u>6</u> FAC species <u>130</u> x3= <u>390</u> FACU species <u>26</u> x4= <u>104</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>159</u> (A) <u>500</u> (B) Prevalence Index = B/A= <u>3.14</u>
Sapling/Shrub Stratum				
1. <u>Alnus sinuata</u>	<u>55</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Salix pulchra</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover:	<u>75</u>			
50% of total cover:	<u>37.5</u>	20% of total cover:	<u>15</u>	
Herb Stratum				Hydrophytic Vegetation Indicators: X Dominance Test is >50% Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
1. <u>Calamagrostis canadensis</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Veratrum viride</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Dryopteris expansa</u>	<u>15</u>	<u>No</u>	<u>FACU</u>	
4. <u>Epilobium angustifolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
5. <u>Cornus canadensis</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
6. <u>Gymnocarpium dryopteris</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
7. <u>Sanguisorba canadensis</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover:	<u>84</u>			
50% of total cover:	<u>42</u>	20% of total cover:	<u>16.8</u>	
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u> </u>		% Cover of Bryophytes <u> </u>		
(Where applicable)				

Remarks:

CAWTS

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oe
2-18	7.5YR 3/3	100					No	Silt Loam	hor:A/B
18-21	10YR 4/4	100					No	Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: MWD - Moderately Well Drained					

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):			
Water Table Present?	Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):	10.0		
Saturation Present?	Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):	8.0		
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Saturation and water in pit attributed to recent heavy rains.

Geomorphic Position:



Photo Name: Photo_180620114500



Photo Name: Photo_180620114540



Photo Name: Photo_180620114507

Additional Reference Data: Photos

HDR1010_18



Photo Name: Photo_180620114529



Photo Name: Photo_180620114452



Photo Name: Photo_180620114517

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/20/2018
 Applicant/Owner: PLP Sampling Point: HDR1011_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 6 HGM: Slope
 Subregion (LRR): X Lat: 59.910849 Long: -155.445954 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/3B

Vegetation Type: Ericaceous Shrub Bog (ESB)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix reticulata</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Empetrum nigrum</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACW species <u>10</u> x2= <u>20</u>
4. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>111</u> x3= <u>333</u>
5. <u>Andromeda polifolia</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	FACU species <u> </u> x4= <u> </u>
6. <u>Vaccinium vitis-idaea</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>83</u>				Column Totals: <u>121</u> (A) <u>353</u> (B)
50% of total cover: <u>41.5</u>				<u>Prevalence Index = B/A=</u> <u>2.92</u>
20% of total cover: <u>16.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Rubus stellatus</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Sanguisorba canadensis</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Ranunculus sp.</u>	<u>3</u>	<u>No</u>	<u>N/A</u>	
7. <u>Equisetum variegatum</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Petasites frigidus s.l.</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>41</u>				
50% of total cover: <u>20.5</u>				
20% of total cover: <u>8.2</u>				
Plot size (radius, or length x width) <u>10 ft</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>60</u>				
% Cover of Bryophytes <u> </u>				
(Where applicable)				

Remarks: ESB.
Sphagnum at 60".

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-12									hor:Oe
12-22									hor:Oa 60 % Cobble

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: None Depth (inches): Field Drainage Class: VPD - Very Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 2.0 Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 10.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 2.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Surface water in depressional areas.

Geomorphic Position: Bench on slope.



Photo Name: Photo_180620122724



Photo Name: Photo_180620122755



Photo Name: Photo_180620122701



Photo Name: Photo_180620122740



Photo Name: Photo_180620122801



Photo Name: Photo_180620122711

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/20/2018
 Applicant/Owner: PLP Sampling Point: HDR1012_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 5 HGM: N/A
 Subregion (LRR): X Lat: 59.910847 Long: -155.446250 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>			

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Vaccinium uliginosum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Ledum decumbens</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
4. <u>Arctous rubra</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FAC species <u>138</u> x3= <u>414</u>
5. <u>Betula nana</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACU species <u>3</u> x4= <u>12</u>
6. <u>Vaccinium vitis-idaea</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>115</u>				Column Totals: <u>141</u> (A) <u>426</u> (B)
50% of total cover: <u>57.5</u>				<u>Prevalence Index = B/A=</u> <u>3.02</u>
20% of total cover: <u>23</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Lycopodium annotinum s.l.</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>26</u>				
50% of total cover: <u>13</u>				
20% of total cover: <u>5.2</u>				
Plot size (radius, or length x width) <u>10 ft</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u> </u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u> </u>				Present?
(Where applicable)				
Remarks: <u>DEST</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-4									hor:Oe
4-19	10YR 4/3	20					No	Silt Loam	hor:A/B 50% Cobble From 8 To 19.
4-19	7.5YR 3/2	80					No	Silt Loam	hor:A/B 50% Cobble From 8 To 19.
19-21	10YR 4/3	100					No	Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: MWD - Moderately Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> X No <input type="checkbox"/> Depth (inches): 16.0	
Saturation Present? Yes <input type="checkbox"/> X No <input type="checkbox"/> Depth (inches): 14.0	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Not saturated in upper 12 inches of soil profile.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1012_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Salix arctica	5	No	FAC

Additional Reference Data: Photos

HDR1012_18



Photo Name: Photo_180620131732



Photo Name: Photo_180620131753



Photo Name: Photo_180620131810



Photo Name: Photo_180620131804



Photo Name: Photo_180620131743



Photo Name: Photo_180620131721

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/20/2018
 Applicant/Owner: PLP Sampling Point: HDR1015_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 2 HGM: Slope
 Subregion (LRR): X Lat: 59.912791 Long: -155.427301 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/3B

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation.</u>					

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Salix reticulata</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>8</u> x2= <u>16</u>
4. <u>Betula nana ssp. exilis</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FAC species <u>129</u> x3= <u>387</u>
5. <u>Ledum decumbens</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>1</u> x4= <u>4</u>
6. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>99</u>				Column Totals: <u>138</u> (A) <u>407</u> (B)
50% of total cover: <u>49.5</u>				Prevalence Index = B/A= <u>2.95</u>
20% of total cover: <u>19.8</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Petasites frigidus s.l.</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	Morphological Adaptations ¹ (Provide
4. <u>Senecio atropurpureus s.l.</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Polygonum bistorta ssp. plumosum</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>39</u>				
50% of total cover: <u>19.5</u>				
20% of total cover: <u>7.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-8									hor:Oe
8-21	2.5YR 4/1	85	7.5YR4/4	15	C	PL	No	Silt Loam	hor:A/B 15% Cobble

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: None		
Depth (inches):		
Field Drainage Class: SPD - Somewhat Poorly Drained		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):		
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):	16.0	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):	6.0	
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1015_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Vaccinium vitis-idaea	5	No	FAC
Alnus sinuata	3	No	FAC
Salix arctica	3	No	FAC
Andromeda polifolia	3	No	FACW

Additional Reference Data: Photos

HDR1015_18



Photo Name: Photo_180620150553



Photo Name: Photo_180620150716

Additional Reference Data: Photos

HDR1015_18



Photo Name: Photo_180620150544



Photo Name: Photo_180620150605



Photo Name: Photo_180620150618



Photo Name: Photo_180620150640

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/20/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1016_18</u>	
Investigators: <u>ZH TP</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>8</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.913071</u>	Long: <u>-155.426870</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra (DEST)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>75</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Alnus sinuata</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACW species <u>1</u> x2= <u>2</u>
4. <u>Betula nana</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FAC species <u>109</u> x3= <u>327</u>
5. <u>Ledum decumbens</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>21</u> x4= <u>84</u>
6. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>87</u>				Column Totals: <u>131</u> (A) <u>413</u> (B)
50% of total cover: <u>43.5</u>				<u>Prevalence Index = B/A=</u> <u>3.15</u>
20% of total cover: <u>17.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Lupinus arcticus</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Anemone narcissiflora</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Angelica lucida</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Cornus canadensis</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
7. <u>Petasites frigidus s.l.</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Luzula sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>45</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>22.5</u>				
20% of total cover: <u>9</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u> </u>		% Cover of Bryophytes <u> </u>		
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-4									hor:Oe
4-22	10YR 4/2	40					No	Sandy Loam	hor:B/C
4-22	10YR 4/4	60					No	Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: MWD - Moderately Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> X No <input type="checkbox"/> Depth (inches): 20.0	
Saturation Present? Yes <input type="checkbox"/> X No <input type="checkbox"/> Depth (inches): 18.0	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Not saturated in upper 12 inches of soil profile.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1016_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Salix arctica	1	No	FAC
Picea glauca	1	No	FACU

Additional Reference Data: Photos

HDR1016_18



Photo Name: Photo_180620154838



Photo Name: Photo_180620154800

Photo Name: Photo_180620154852



Photo Name: Photo_180620154908



Photo Name: Photo_180620154832





Photo Name: Photo_180620154811

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	6/21/2018
Applicant/Owner:	PLP			Sampling Point:	HDR1017_18
Investigators:	ZH TP	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	None	Slope(%):	8	HGM:	N/A
Subregion (LRR):	X	Lat:	59.913402	Long:	-155.426339
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	U		

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u> </u> X
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>			

Tree Stratum				Dominance Test Worksheet:			
		Absolute % Cover	Dominant Species?	Indicator Status			
1.					Number of Dominant Species		
2.					That Are OBL, FACW, or FAC: 3 (A)		
3.					Total Number of Dominant		
4.					Species Across All Strata: 4 (B)		
Total Cover: _____					Percent of Dominant Species		
50% of total cover: 0			20% of total cover: 0		That Are OBL, FACW, or FAC: 75 (A/B)		
Sapling/Shrub Stratum				Prevalence Index worksheet:			
					Total % Cover of: _____ Multiply by: _____		
1.	Salix pulchra	3	Yes	FAC	OBL species	x1=	_____
2.	Salix reticulata	3	Yes	FAC	FACW species	15 x2=	30
3.	Spiraea stevenii	3	Yes	FACU	FAC species	94 x3=	282
4.					FACU species	10 x4=	40
5.					UPL species	5 x5=	25
6.					Column Totals:	124 (A)	377 (B)
Total Cover: 9			20% of total cover: 1.8		Prevalence Index = B/A= 3.04		
50% of total cover: 4.5							
Herb Stratum				Hydrophytic Vegetation Indicators:			
1.	Calamagrostis canadensis	65	Yes	FAC	X	Dominance Test is >50%	
2.	Equisetum arvense	15	No	FAC		Prevalence Index is ≤3.0	
3.	Petasites frigidus s.l.	15	No	FACW		Morphological Adaptations ¹ (Provide	
4.	Angelica lucida	5	No	FACU		data in Remarks or on a separate sheet)	
5.	Lagotis glauca s.l.	5	No	NL		Problematic Hydrophytic Vegetation ¹ (Explain)	
6.	Aconitum delphiniiifolium	3	No	FAC	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.		
7.	Valeriana sitchensis	3	No	FAC			
8.	Polemonium acutiflorum	1	No	FAC			
9.	Veratrum viride	1	No	FAC			
10.	Cornus canadensis	1	No	FACU	Hydrophytic Vegetation Present? Yes <u>X</u> No _____		
Total Cover: 116			20% of total cover: 23.2				
50% of total cover: 58			Plot size (radius, or length x width) 1/10 acre % Bare Ground 0				
% Cover of Wetland Bryophytes _____ (Where applicable)		% Cover of Bryophytes _____					

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Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-6									hor:Oe
6-13	10YR 3/2	70					No	Sandy Loam	hor:A/B
6-13	10YR 4/4	30					No	Sandy Loam	hor:A/B
13-22	10YR 4/3	90	10YR 5/6	10	C	M	No	Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: MWD - Moderately Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):	
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 20.0	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 15.0	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Not saturated in upper 12 inches of soil profile.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1017_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Polygonum bistorta ssp. plumosum	1	No	FACU
Stellaria sp.	1	No	N/A

Additional Reference Data: Photos

HDR1017_18



Photo Name: Photo_180620162041



Photo Name: Photo_180620162106

Additional Reference Data: Photos

HDR1017_18



Photo Name: Photo_180620162014



Photo Name: Photo_180620162027



Photo Name: Photo_180620161959



Photo Name: Photo_180620162122

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/21/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1018_18</u>	
Investigators: <u>ZH TP</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>7</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.913563</u>	Long: <u>-155.425882</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra (DEST)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>6</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>83</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix reticulata</u>	<u>45</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Empetrum nigrum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Andromeda polifolia</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	FACW species <u>4</u> x2= <u>8</u>
4. <u>Vaccinium uliginosum</u>	<u>T</u>	<u>No</u>	<u>FAC</u>	FAC species <u>112</u> x3= <u>336</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>8</u> x4= <u>32</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u>3</u> x5= <u>15</u>
Total Cover: <u>88</u>				Column Totals: <u>127</u> (A) <u>391</u> (B)
50% of total cover: <u>44</u>				<u>Prevalence Index = B/A=</u> <u>3.08</u>
20% of total cover: <u>17.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Lupinus arcticus</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Anemone narcissiflora</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Lagotis glauca s.l.</u>	<u>3</u>	<u>No</u>	<u>NL</u>	
7. <u>Rubus arcticus s.l.</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Valeriana sitchensis</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Equisetum variegatum</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
10. <u>Carex sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	
Total Cover: <u>41</u>				
50% of total cover: <u>20.5</u>				
20% of total cover: <u>8.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Cover of Wetland Bryophytes <u> </u>				Vegetation
% Cover of Bryophytes <u> </u>				Yes <u>X</u> No <u> </u>
(Where applicable)				Present?
Remarks: <u>DEST</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-6									hor:Oe
6-19	10YR 3/3	30	10YR 4/6	5	C	M	No	Sandy Loam	hor:B/C 20 % Gravels
6-19	10YR 4/3	65					No	Sandy Loam	hor:B/C 20 % Gravels

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: MWD - Moderately Well Drained					

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	X	No
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):				
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	7.0			
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	4.0			
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Saturated between 4 and 9 inches and seeps into pit.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1018_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Pedicularis sp.	1	No	N/A

Additional Reference Data: Photos

HDR1018_18



Photo Name: Photo_180621083230



Photo Name: Photo_180621083214

Additional Reference Data: Photos

HDR1018_18



Photo Name: Photo_180621083303



Photo Name: Photo_180621083253



Photo Name: Photo_180621083243



Photo Name: Photo_180621083221

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/21/2018
 Applicant/Owner: PLP Sampling Point: HDR1020_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 2 HGM: Slope
 Subregion (LRR): X Lat: 59.912833 Long: -155.422234 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1B

Vegetation Type: Closed Willow Tall Shrub (CWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil X or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: Wetter than normal antecedent precipitation.					

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>2</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>1</u> x2= <u>2</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>140</u> x3= <u>420</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>8</u> x4= <u>32</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>80</u>				Column Totals: <u>149</u> (A) <u>454</u> (B)
50% of total cover: <u>40</u>				Prevalence Index = B/A= <u>3.05</u>
20% of total cover: <u>16</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>45</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Veratrum viride</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Angelica lucida</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Epilobium angustifolium</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Geranium erianthum</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
7. <u>Lycopodium annotinum s.l.</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
8. <u>Sanguisorba canadensis</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>69</u>				
50% of total cover: <u>34.5</u>				
20% of total cover: <u>13.8</u>				
Plot size (radius, or length x width) <u>20 ft</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u>				
(Where applicable)				
Remarks:				
CWTS				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oe
1-9	7.5YR 2.5/1	100					No	Silt Loam	hor:A
9-21	2.5Y 4/2	75	7.5YR 3/4	10	C	M		Sandy Loam	hor:B
9-21			7.5YR 4/4	15	C	M		Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:

☐ Histosol or Histel (A1)

☐ Histic Epipedon (A2)

☐ Hydrogen Sulfide (A4)

☐ Thick Dark Surface (A12)

☐ Alaska Gleyed (A13)

☐ Alaska Redox (A14)

☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:

☐ Alaska Color Change (TA4)⁴

☐ Alaska Alpine Swales (TA5)

☒ Alaska Redox With 2.5Y Hue

☐ Alaska Gleyed Without Hue 5Y or Redder

☐ Underlying Layer

☐ Other (Explain in Remarks)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,
and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

Restrictive Layer (if present):
Type: _____
Depth (inches): N/A
Field Drainage Class: SPD - Somewhat Poorly Drained

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)

☐ Surface Water (A1)

☒ High Water Table (A2)

☒ Saturation (A3)

☐ Water Marks (B1)

☐ Sediment Deposits (B2)

☐ Drift Deposits (B3)

☐ Algal Mat or Crust (B4)

☐ Iron Deposits (B5)

☐ Surface Soil Cracks (B6)

☐ Inundation Visible on Aerial Imagery (B7)

☐ Sparsely Vegetated Concave Surface (B8)

☐ Marl Deposits (B15)

☐ Hydrogen Sulfide Odor (C1)

☐ Dry Season Water Table (C2)

☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

☐ Water-stained Leaves (B9)

☐ Drainage Patterns (B10)

☐ Oxidized Rhizospheres along Living Roots (C3)

☐ Presence of Reduced Iron (C4)

☐ Salt Deposits (C5)

☐ Stunted or Stressed Plants (D1)

☒ Geomorphic Position (D2)

☐ Shallow Aquitard (D3)

☐ Microtopographic Relief (D4)

☐ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ☐ No ☒ Depth (inches): _____
Water Table Present? Yes ☒ No ☐ Depth (inches): 9.0
Saturation Present? Yes ☒ No ☐ Depth (inches): 6.0
(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position: Located at toe of bench below upslope wetland.

Additional Reference Data: Photos

HDR1020_18



Photo Name: Photo_180621095842



Photo Name: Photo_180621095727



Photo Name: Photo_180621095741

Additional Reference Data: Photos

HDR1020_18



Photo Name: Photo_180621095900



Photo Name: Photo_180621095801



Photo Name: Photo_180621095749

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	6/21/2018
Applicant/Owner:	PLP			Sampling Point:	HDR1021_18
Investigators:	ZH TP	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	None	Slope(%):	2	HGM:	Slope
Subregion (LRR):	X	Lat:	59.912737	Long:	-155.422096
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	PSS1B		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum				Dominance Test Worksheet:			
		Absolute % Cover	Dominant Species?	Indicator Status			
1.					Number of Dominant Species		
2.					That Are OBL, FACW, or FAC: 2 (A)		
3.					Total Number of Dominant		
4.					Species Across All Strata: 3 (B)		
Total Cover: _____					Percent of Dominant Species		
50% of total cover: 0			20% of total cover: 0		That Are OBL, FACW, or FAC: 67 (A/B)		
Sapling/Shrub Stratum				Prevalence Index worksheet:			
					Total % Cover of: _____ Multiply by: _____		
1.	Alnus sinuata	80	Yes	FAC	OBL species _____ x1= _____		
2.					FACW species _____ x2= _____		
3.					FAC species 108 x3= 324		
4.					FACU species 35 x4= 140		
5.					UPL species _____ x5= _____		
6.					Column Totals: 143 (A) 464 (B)		
Total Cover: 80			20% of total cover: 16		Prevalence Index = B/A= 3.24		
50% of total cover: 40							
Herb Stratum				Hydrophytic Vegetation Indicators:			
1.	Thelypteris phegopteris	35	Yes	FACU	X Dominance Test is >50%		
2.	Calamagrostis canadensis	15	Yes	FAC	Prevalence Index is ≤3.0		
3.	Equisetum arvense	10	No	FAC	Morphological Adaptations ¹ (Provide		
4.	Veratrum viride	3	No	FAC	data in Remarks or on a separate sheet)		
5.	Viola sp.	3	No	N/A	Problematic Hydrophytic Vegetation ¹ (Explain)		
6.							
7.							
8.							
9.							
10.							
Total Cover: 66			20% of total cover: 13.2				
50% of total cover: 33							
Plot size (radius, or length x width) 1/10 acre			% Bare Ground 25				
% Cover of Wetland Bryophytes 0			% Cover of Bryophytes _____				
(Where applicable)							
				Hydrophytic Vegetation Present? Yes X No _____			

Remarks:
CATS

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oe
1-11									hor:Oa
11-20	2.5 Y 4/3	90	10 YR 4 /4	10	C	M	No	Sandy Loam	hor:B/C 10% Gravel

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> No
Type: None				
Depth (inches):				
Field Drainage Class: PD - Poorly Drained				

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> No
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):			
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	10.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	2.0		
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water in pit currently at 10 inches and rising.

Geomorphic Position: Plot located on bench below upslope wetlands.

Additional Reference Data: Photos

HDR1021_18



Photo Name: Photo_180621103331



Photo Name: Photo_180621103337



Photo Name: Photo_180621103323



Photo Name: Photo_180621103315



Photo Name: Photo_180621103309



Photo Name: Photo_180621103257

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/21/2018
 Applicant/Owner: PLP Sampling Point: HDR1023_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 11 HGM: N/A
 Subregion (LRR): X Lat: 59.901685 Long: -155.437329 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Prevalence Index worksheet:				
Total % Cover of:		Multiply by:		
1. <u>Empetrum nigrum</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Vaccinium uliginosum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>2</u> x2= <u>4</u>
3. <u>Betula nana</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	FAC species <u>138</u> x3= <u>414</u>
4. <u>Ledum decumbens</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	FACU species <u>4</u> x4= <u>16</u>
5. <u>Vaccinium vitis-idaea</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
6. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Column Totals: <u>144</u> (A) <u>434</u> (B)
Total Cover: <u>118</u>				Prevalence Index = B/A= <u>3.01</u>
50% of total cover: <u>59</u>				
20% of total cover: <u>23.6</u>				
Hydrophytic Vegetation Indicators:				
X Dominance Test is >50%				
Prevalence Index is ≤3.0				
Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet)				
Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>				

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Empetrum nigrum</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Vaccinium uliginosum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Betula nana</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	
4. <u>Ledum decumbens</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	
5. <u>Vaccinium vitis-idaea</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
6. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>118</u>				
50% of total cover: <u>59</u>				
20% of total cover: <u>23.6</u>				
Herb Stratum				
1. <u>Carex bigelowii</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
3. <u>Lycopodium annotinum s.l.</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
4. <u>Petasites frigidus s.l.</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
5. <u>Rubus chamaemorus</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>26</u>				
50% of total cover: <u>13</u>				
20% of total cover: <u>5.2</u>				
Plot size (radius, or length x width) <u>10 ft</u>				% Bare Ground <u>0</u>
% Cover of Wetland Bryophytes <u>5</u>		% Cover of Bryophytes <u> </u>		
(Where applicable)				

Remarks:
 DEST-H

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-4									hor:Oe
4-6	10YR 2/1	100					No	Silt Loam	hor:A
6-18	10YR 3/2	100					No	Silt Loam	hor:B Large Angular Cobbles
18-22	10YR 4/4	100					No	Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: MWD - Moderately Well Drained	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input checked="" type="checkbox"/> X No <input type="checkbox"/> Depth (inches): 19.0	
Saturation Present? Yes <input checked="" type="checkbox"/> X No <input type="checkbox"/> Depth (inches): 16.0	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Not saturated in upper 12 inches of soil profile.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1023_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub <u>Spiraea stevenii</u>	<u>3</u>	<u>No</u>	<u>FACU</u>

Additional Reference Data: Photos

HDR1023_18



Photo Name: Photo_180621124325



Photo Name: Photo_180621124457



Photo Name: Photo_180621124335



Photo Name: Photo_180621124447



Photo Name: Photo_180621124349

Additional Reference Data: Photos

HDR1023_18



Photo Name: Photo_180621124430



Photo Name: Photo_180621124316

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/21/2018
 Applicant/Owner: PLP Sampling Point: HDR1024_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 8 HGM: Slope
 Subregion (LRR): X Lat: 59.901683 Long: -155.437474 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/3C

Vegetation Type: Ericaceous Shrub Bog (ESB)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: Wetter than normal antecedent precipitation.					

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>6</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>6</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Salix reticulata</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Betula nana</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix pulchra</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>19</u> x2= <u>38</u>
4. <u>Vaccinium uliginosum</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	FAC species <u>133</u> x3= <u>399</u>
5. <u>Empetrum nigrum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u> </u> x4= <u> </u>
6. <u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	UPL species <u>5</u> x5= <u>25</u>
Total Cover: <u>81</u>				Column Totals: <u>157</u> (A) <u>462</u> (B)
50% of total cover: <u>40.5</u>				Prevalence Index = B/A= <u>2.94</u>
20% of total cover: <u>16.2</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Rubus chamaemorus</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Pedicularis sp.</u>	<u>5</u>	<u>No</u>	<u>N/A</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Lagotis glauca s.l.</u>	<u>5</u>	<u>No</u>	<u>NL</u>	
7. <u>Petasites frigidus s.l.</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Poa arctica</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Valeriana sitchensis</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u>Equisetum variegatum</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>81</u>				
50% of total cover: <u>40.5</u>				
20% of total cover: <u>16.2</u>				
Plot size (radius, or length x width) <u>10 ft</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>60</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u> </u>				Present?
(Where applicable)				
Remarks:				
ESB.				
On border of OWLS.				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-6									hor:Oi
6-17									hor:Oe 50 % Cobble
17-20	10YR 4/4	100						Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: None Depth (inches): Field Drainage Class: PD - Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Iron Deposits (B5)			<input checked="" type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input checked="" type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 3.0 Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 2.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Surface water in small pools.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1024_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Alnus sinuata</u>	<u>1</u>	<u>No</u>	<u>FAC</u>

Additional Reference Data: Photos

HDR1024_18



Photo Name: Photo_180621132331



Photo Name: Photo_180621132308



Photo Name: Photo_180621132320



Photo Name: Photo_180621132347

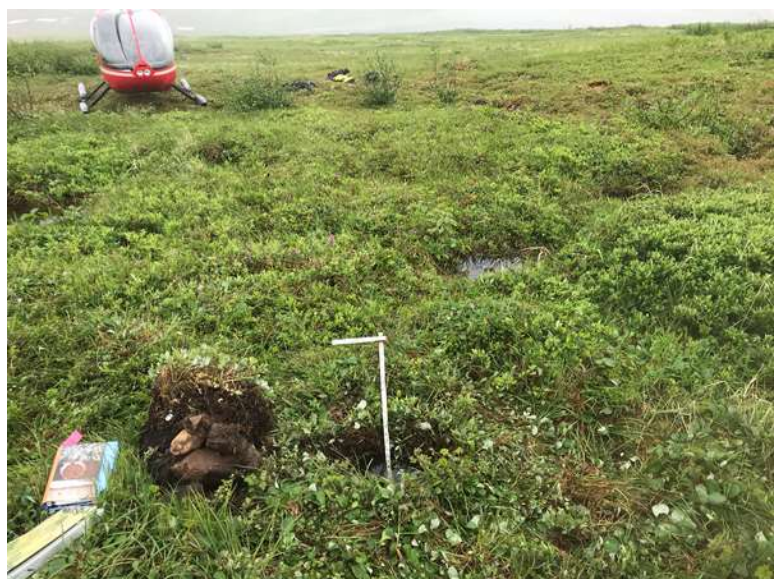


Photo Name: Photo_180621132258

Additional Reference Data: Photos

HDR1024_18



Photo Name: Photo_180621132241

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/21/2018
 Applicant/Owner: PLP Sampling Point: HDR1026_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 5 HGM: Slope
 Subregion (LRR): X Lat: 59.901602 Long: -155.435858 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PEM1B

Vegetation Type: Bluejoint Herb (BH)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Empetrum nigrum</u>	10	Yes	FAC	OBL species <u> </u> x1= <u> </u>
2. <u>Betula nana</u>	5	Yes	FAC	FACW species <u>10</u> x2= <u>20</u>
3. <u>Vaccinium uliginosum</u>	5	Yes	FAC	FAC species <u>114</u> x3= <u>342</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>1</u> x4= <u>4</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>125</u> (A) <u>366</u> (B)
Total Cover: <u>20</u>				<u>Prevalence Index = B/A=</u> <u>2.93</u>
50% of total cover: <u>10</u>				
20% of total cover: <u>4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	70	Yes	FAC	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	10	No	FAC	<u>X</u> Prevalence Index is ≤3.0
3. <u>Valeriana sitchensis</u>	10	No	FAC	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Petasites frigidus s.l.</u>	5	No	FACW	<u> </u> data in Remarks or on a separate sheet)
5. <u>Rubus chamaemorus</u>	5	No	FACW	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Aconitum delphinifolium</u>	3	No	FAC	
7. <u>Equisetum sylvaticum</u>	1	No	FAC	¹ Indicators of hydric soil and wetland hydrology
8. <u>Angelica lucida</u>	1	No	FACU	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>105</u>				
50% of total cover: <u>52.5</u>				
20% of total cover: <u>21</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic Vegetation Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				Present?
(Where applicable)				

Remarks:

BH

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-9									hor:Oe
9-16									hor:Oa 50 % Cobble
16-21	2.5Y 4/2	70	10YR 4/6	30	C	M	No	Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present): Type: <u>None</u> Depth (inches): _____ Field Drainage Class: <u>PD - Poorly Drained</u>	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply)	<i>Secondary Indicators (2 or more required)</i>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-stained Leaves (B9)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input checked="" type="checkbox"/> Microtopographic Relief (D4)
	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>5.0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>0.0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR1026_18



Photo Name: Photo_180621140232



Photo Name: Photo_180621140244



Photo Name: Photo_180621140311

Additional Reference Data: Photos

HDR1026_18



Photo Name: Photo_180621140302



Photo Name: Photo_180621140220



Photo Name: Photo_180621140204

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/21/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1027_18</u>	
Investigators: <u>ZH TP</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>5</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.901531</u>	Long: <u>-155.434933</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Ericaceous Shrub Bog (ESB)</u>		NWI Classification: <u>PSS1/3B</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>7</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>8</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>88</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Vaccinium uliginosum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Betula nana</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Empetrum nigrum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>10</u> x2= <u>20</u>
4. <u>Salix pulchra</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FAC species <u>133</u> x3= <u>399</u>
5. <u>Salix reticulata</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACU species <u>1</u> x4= <u>4</u>
6. <u>Ledum decumbens</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	UPL species <u>6</u> x5= <u>30</u>
Total Cover: <u>108</u>				Column Totals: <u>150</u> (A) <u>453</u> (B)
50% of total cover: <u>54</u>				<u>Prevalence Index = B/A=</u> <u>3.02</u>
20% of total cover: <u>21.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Petasites frigidus s.l.</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Rubus chamaemorus</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Lagotis glauca s.l.</u>	<u>5</u>	<u>Yes</u>	<u>NL</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Anemone richardsonii</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
8. <u>Senecio atropurpureus s.l.</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
9. <u>Polygonum bistorta ssp. plumosum</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
10. <u>Artemisia arctica</u>	<u>1</u>	<u>No</u>	<u>NL</u>	
Total Cover: <u>42</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>21</u>				
20% of total cover: <u>8.4</u>				
Plot size (radius, or length x width) <u>20 ft</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>30</u> % Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks: <u>ESB.</u>				
<u>30% sphagnum.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-9									hor:Oe
9-14	10 YR 2/1	100					No	Silt Loam	hor:A
14-20	7.5 YR 3/2	80	7.5YR 4/4	20	C	PL	No	Sandy Loam	hor:B 30% Cobble From 7 To 14

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:

☐ Histosol or Histel (A1)

☒ Histic Epipedon (A2)

☐ Hydrogen Sulfide (A4)

☐ Thick Dark Surface (A12)

☐ Alaska Gleyed (A13)

☐ Alaska Redox (A14)

☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:

☐ Alaska Color Change (TA4)⁴

☐ Alaska Alpine Swales (TA5)

☐ Alaska Redox With 2.5Y Hue

☐ Alaska Gleyed Without Hue 5Y or Redder

☐ Underlying Layer

☐ Other (Explain in Remarks)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

Restrictive Layer (if present):
Type:
Depth (inches):

N/A

Field Drainage Class:

SPD - Somewhat Poorly Drained

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)

☒ Surface Water (A1)

☒ High Water Table (A2)

☒ Saturation (A3)

☐ Water Marks (B1)

☐ Sediment Deposits (B2)

☐ Drift Deposits (B3)

☐ Algal Mat or Crust (B4)

☐ Iron Deposits (B5)

☐ Surface Soil Cracks (B6)

☐ Inundation Visible on Aerial Imagery (B7)

☐ Sparsely Vegetated Concave Surface (B8)

☐ Marl Deposits (B15)

☐ Hydrogen Sulfide Odor (C1)

☐ Dry Season Water Table (C2)

☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

☐ Water-stained Leaves (B9)

☐ Drainage Patterns (B10)

☐ Oxidized Rhizospheres along Living Roots (C3)

☐ Presence of Reduced Iron (C4)

☐ Salt Deposits (C5)

☐ Stunted or Stressed Plants (D1)

☐ Geomorphic Position (D2)

☐ Shallow Aquitard (D3)

☒ Microtopographic Relief (D4)

☒ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ☒ No ☐ Depth (inches):

6.0

Water Table Present? Yes ☒ No ☐ Depth (inches):

7.0

Saturation Present? Yes ☒ No ☐ Depth (inches):

4.0

(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water present in nearby pools.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1027_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Vaccinium vitis-idaea</u>	<u>3</u>	<u>No</u>	<u>FAC</u>

Additional Reference Data: Photos

HDR1027_18



Photo Name: Photo_180621150724



Photo Name: Photo_180621150638

Additional Reference Data: Photos

HDR1027_18



Photo Name: Photo_180621150715



Photo Name: Photo_180621150646



Photo Name: Photo_180621150629

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/22/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1029_18</u>	
Investigators: <u>ZH TP</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>9</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u> Lat: <u>59.887901</u>	Long: <u>-155.426539</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>7</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>71</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>10</u> x2= <u>20</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>91</u> x3= <u>273</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>19</u> x4= <u>76</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>60</u>				Column Totals: <u>120</u> (A) <u>369</u> (B)
50% of total cover: <u>30</u>				Prevalence Index = B/A= <u>3.08</u>
20% of total cover: <u>12</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	Prevalence Index is ≤3.0
3. <u>Veratrum viride</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Viola epipsila</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Geranium erianthum</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Heracleum maximum</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	
7. <u>Pyrola grandiflora</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Rubus arcticus s.l.</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Sedum rosea ssp. integrifolium</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
10. <u>Angelica lucida</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>60</u>				
50% of total cover: <u>30</u>				
20% of total cover: <u>12</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>5</u>				
% Cover of Wetland Bryophytes <u>10</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
(Where applicable)				

Remarks: OWLS

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-3									hor:Oe
3-9									hor:Oa
9-12	10YR 2/2	100					No	Silt Loam	hor:A
12-19	10YR 3/2	100					No	Silt Loam	hor:A/B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No	<input type="checkbox"/>
Type: None						
Depth (inches):						
Field Drainage Class: PD - Poorly Drained						

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No	<input type="checkbox"/>
Surface Water Present? Yes <input checked="" type="checkbox"/> X No <input type="checkbox"/>	Depth (inches): 1.0					
Water Table Present? Yes <input checked="" type="checkbox"/> X No <input type="checkbox"/>	Depth (inches): 1.0					
Saturation Present? Yes <input checked="" type="checkbox"/> X No <input type="checkbox"/>	Depth (inches): 0.0					
(includes capillary fringe)						

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water 1" in low areas and overland flow in drainage patterns.

Geomorphic Position: Plot located at toe of slope break.

Additional Reference Data: Overflow Vegetation

HDR1029_18

	Absolute % Cover	Dominant Species?	Indicator Status
Herb			
Solidago multiradiata	3	No	FACU
Anemone richardsonii	1	No	FAC
Valeriana sitchensis	1	No	FAC
Epilobium anqustifolium	1	No	FACU
Mertensia paniculata	1	No	FACU
Streptopus amplexifolius	1	No	FACU

Additional Reference Data: Photos

HDR1029_18



Photo Name: Photo_180622090912



Photo Name: Photo_180622090857

Additional Reference Data: Photos

HDR1029_18



Photo Name: Photo_180622090825



Photo Name: Photo_180622090843



Photo Name: Photo_180622090811



Photo Name: Photo_180622090926

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	6/22/2018
Applicant/Owner:	PLP			Sampling Point:	HDR1031_18
Investigators:	ZH TP	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	Convex	Slope(%):	8	HGM:	N/A
Subregion (LRR):	X	Lat:	59.887139	Long:	-155.424041
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	U		

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.) _____

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			

Tree Stratum		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:			
1.					Number of Dominant Species			
2.					That Are OBL, FACW, or FAC: 5 (A)			
3.					Total Number of Dominant			
4.					Species Across All Strata: 8 (B)			
Total Cover:					Percent of Dominant Species			
50% of total cover: 0					That Are OBL, FACW, or FAC: 62 (A/B)			
20% of total cover: 0								
Sapling/Shrub Stratum					Prevalence Index worksheet:			
1.	Salix pulchra	60	Yes	FAC	Total % Cover of:		Multiply by:	
2.	Empetrum nigrum	10	No	FAC	OBL species	x1=		
3.	Vaccinium uliginosum	3	No	FAC	FACW species	10 x2=	20	
4.					FAC species	99 x3=	297	
5.					FACU species	26 x4=	104	
6.					UPL species	1 x5=	5	
Total Cover: 73					Column Totals:	136 (A)	426 (B)	
50% of total cover: 36.5					Prevalence Index = B/A= 3.13			
20% of total cover: 14.6								
Herb Stratum					Hydrophytic Vegetation Indicators:			
1.	Calamagrostis canadensis	10	Yes	FAC	X	Dominance Test is >50%		
2.	Sanguisorba canadensis	10	Yes	FACW		Prevalence Index is ≤3.0		
3.	Sedum rosea ssp. integrifolium	5	Yes	FAC		Morphological Adaptations ¹ (Provide		
4.	Viola epipsila	5	Yes	FAC		data in Remarks or on a separate sheet)		
5.	Geranium erianthum	5	Yes	FACU		Problematic Hydrophytic Vegetation ¹ (Explain)		
6.	Heracleum maximum	5	Yes	FACU				
7.	Lycopodium annotinum s.l.	5	Yes	FACU				
8.	Rubus arcticus s.l.	3	No	FAC				
9.	Angelica lucida	3	No	FACU				
10.	Epilobium angustifolium	3	No	FACU				
Total Cover: 66					¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.			
50% of total cover: 33								
20% of total cover: 13.2								
Plot size (radius, or length x width) 1/10 acre					Hydrophytic Vegetation Present? Yes X No			
% Cover of Wetland Bryophytes (Where applicable)					% Cover of Bryophytes			

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Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-5									hor:Oe
5-12	10YR 3/2	40					No	Silt Loam	hor:A/B
5-12	10YR 3/3	60					No	Silt Loam	hor:A/B
12-19	7.5YR 3/2	100					No	Sandy Loam	hor:B/C 15 % Cobble

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: MWD - Moderately Well Drained					

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	X	No
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): 1.0				
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): 2.0				
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (includes capillary fringe)	Depth (inches): 1.0				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
1" surface water in few small depressions.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1031_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Gymnocarpium dryopteris	3	No	FACU
Senecio sp.	3	No	NULL
Anemone richardsonii	1	No	FAC
Festuca altaica	1	No	FAC
Veratrum viride	1	No	FAC
Anemone narcissiflora	1	No	FACU
Streptopus amplexifolius	1	No	FACU
Artemisia arctica	1	No	NL

Additional Reference Data: Photos

HDR1031_18



Photo Name: Photo_180622101936



Photo Name: Photo_180622102026

Additional Reference Data: Photos

HDR1031_18



Photo Name: Photo_180622102033



Photo Name: Photo_180622101957



Photo Name: Photo_180622101948

Additional Reference Data: Photos

HDR1031_18



Photo Name: Photo_180622102009

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/22/2018
 Applicant/Owner: PLP Sampling Point: HDR1032_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 5 HGM: Slope
 Subregion (LRR): X Lat: 59.896399 Long: -155.472368 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS3/EM1C

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>75</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Empetrum nigrum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>3</u> x1= <u>3</u>
2. <u>Salix pulchra</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>1</u> x2= <u>2</u>
3. <u>Salix arctica</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	FAC species <u>88</u> x3= <u>264</u>
4. <u>Vaccinium uliginosum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FACU species <u>16</u> x4= <u>64</u>
5. <u>Vaccinium vitis-idaea</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	UPL species <u>3</u> x5= <u>15</u>
6. <u>Salix reticulata</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	Column Totals: <u>111</u> (A) <u>348</u> (B)
Total Cover: <u>52</u>				<u>Prevalence Index = B/A=</u> <u>3.14</u>
50% of total cover: <u>26</u>				
20% of total cover: <u>10.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Sedum rosea ssp. integrifolium</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Anemone narcissiflora</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Polygonum bistorta ssp. plumosum</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Artemisia arctica</u>	<u>3</u>	<u>No</u>	<u>NL</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Eriophorum angustifolium</u>	<u>3</u>	<u>No</u>	<u>OBL</u>	
7. <u>Equisetum arvense</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
8. <u>Petasites frigidus s.l.</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
9. <u>Pedicularis sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>60</u>				
50% of total cover: <u>30</u>				
20% of total cover: <u>12</u>				
Plot size (radius, or length x width) <u>20 ft</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>25</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u> </u>				Present?
(Where applicable)				

Remarks: DEST.
20% open water.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-6									hor:Oe
6-9									hor:Oa
9-13	10YR 3/2	95	7.5YR 3/3	5	C	M	Yes	Sandy Loam	hor:A
13-19	2.5Y 4/1	70	7.5YR 4/4	30	C	PL	Yes	Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/>	Histosol or Histel (A1)	<input type="checkbox"/>	Alaska Color Change (TA4) ⁴
<input checked="" type="checkbox"/>	Histic Epipedon (A2)	<input type="checkbox"/>	Alaska Alpine Swales (TA5)
<input type="checkbox"/>	Hydrogen Sulfide (A4)	<input type="checkbox"/>	Alaska Redox With 2.5Y Hue
<input type="checkbox"/>	Thick Dark Surface (A12)	<input type="checkbox"/>	Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/>	Alaska Gleyed (A13)	<input type="checkbox"/>	Underlying Layer
<input type="checkbox"/>	Alaska Redox (A14)	<input type="checkbox"/>	Other (Explain in Remarks)
<input type="checkbox"/>	Alaska Gleyed Pores (A15)		
		³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.	
		⁴ Give details of color change in Remarks.	

Restrictive Layer (if present):	
Type: <u>None</u>	
Depth (inches): <u></u>	
Field Drainage Class: <u>PD - Poorly Drained</u>	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks: Redox present as concentrations in the matrix as well as pore linings.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	<input type="checkbox"/> Water-stained Leaves (B9)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>12.0</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>7.0</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>3.0</u> (includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Surface water in pools.
Geomorphic Position: Flat bench on slope.

Additional Reference Data: Photos

HDR1032_18



Photo Name: Photo_180622112002



Photo Name: Photo_180622112100



Photo Name: Photo_180622112024

Additional Reference Data: Photos

HDR1032_18



Photo Name: Photo_180622112035



Photo Name: Photo_180622112015



Photo Name: Photo_180622112051

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/22/2018
 Applicant/Owner: PLP Sampling Point: HDR1033_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Convex Slope(%): 4 HGM: N/A
 Subregion (LRR): X Lat: 59.896526 Long: -155.471451 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B)
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet: <u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u> OBL species <u> </u> x1= <u> </u> FACW species <u> </u> x2= <u> </u> FAC species <u>84</u> x3= <u>252</u> FACU species <u>22</u> x4= <u>88</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>106</u> (A) <u>340</u> (B) <i>Prevalence Index = B/A=</i> <u>3.21</u>
1. <u>Empetrum nigrum</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Salix pulchra</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Vaccinium uliginosum</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
4. <u>Salix arctica</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	
5. <u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
6. <u>Betula nana ssp. exilis</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>72</u>				
50% of total cover: <u>36</u>		20% of total cover: <u>14.4</u>		
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators: X Dominance Test is >50% Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Carex bigelowii</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Anemone narcissiflora</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
3. <u>Pedicularis capitata</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
4. <u>Sedum rosea ssp. integrifolium</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
5. <u>Polygonum bistorta ssp. plumosum</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>34</u>				
50% of total cover: <u>17</u>		20% of total cover: <u>6.8</u>		
Plot size (radius, or length x width) <u>10 ft</u>		% Bare Ground <u> </u>		
% Cover of Wetland Bryophytes <u> </u>		% Cover of Bryophytes <u> </u>		
(Where applicable)				

Remarks:
 DEST.
 Lichen 35%.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-11	7.5YR 4/4	100					No	Sandy Loam	hor:B/C
11-17	7.5YR 4/4	80	5YR 4/6	20	C	M	No	Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: MWD - Moderately Well Drained					

Remarks: Refusal at 17 inches.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):			
Water Table Present?	Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):	14.0		
Saturation Present?	Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):	11.0		
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Heavy recent precipitation. Surface water present in depressions located outside of plot in wetland area.
Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1033_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Picea glauca</u>	<u>1</u>	<u>No</u>	<u>FACU</u>

Additional Reference Data: Photos

HDR1033_18



Photo Name: Photo_180622130925



Photo Name: Photo_180622130910



Photo Name: Photo_180622130852



Photo Name: Photo_180622131013



Photo Name: Photo_180622131005



Photo Name: Photo_180622130949

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/22/2018
 Applicant/Owner: PLP Sampling Point: HDR1035_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Convex Slope(%): 3 HGM: N/A
 Subregion (LRR): X Lat: 59.896221 Long: -155.465408 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Empetrum nigrum</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Salix reticulata</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
3. <u>Dryas octopetala</u>	<u>10</u>	<u>No</u>	<u>NL</u>	FAC species <u>106</u> x3= <u>318</u>
4. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>6</u> x4= <u>24</u>
5. <u>Salix rotundifolia</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	UPL species <u>13</u> x5= <u>65</u>
6. <u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Column Totals: <u>125</u> (A) <u>407</u> (B)
Total Cover: <u>99</u>				<u>Prevalence Index = B/A=</u> <u>3.26</u>
50% of total cover: <u>49.5</u>				
20% of total cover: <u>19.8</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Anemone narcissiflora</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Hierochloa odorata</u>	<u>3</u>	<u>No</u>	<u>NL</u>	Morphological Adaptations ¹ (Provide
4. <u>Sedum rosea ssp. integrifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Valeriana sitchensis</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Polygonum bistorta ssp. plumosum</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>26</u>				
50% of total cover: <u>13</u>				
20% of total cover: <u>5.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>10</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u> </u>				Present?
(Where applicable)				

Remarks: DEST

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oe
2-14	10YR 3/2	40	7.5YR 3/4	2	C	M	No	Silt Loam	hor:B/C
2-14	10YR 4/3	58					No	Silt Loam	hor:B/C
14-18	10YR 4/4	100					No	Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: WD - Well Drained					

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):			
Water Table Present?	Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):	10.0		
Saturation Present?	Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):	7.0		
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Heavy recent precipitation.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1035_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Ledum decumbens	3	No	FAC
Salix pulchra	3	No	FAC
Vaccinium uliginosum	3	No	FAC

Additional Reference Data: Photos

HDR1035_18



Photo Name: Photo_180622141743



Photo Name: Photo_180622141718

Additional Reference Data: Photos

HDR1035_18



Photo Name: Photo_180622141652



Photo Name: Photo_180622141640



Photo Name: Photo_180622141705



Photo Name: Photo_180622141730

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/22/2018</u>
Applicant/Owner: <u>PLP</u>		Sampling Point: <u>HDR1037_18</u>
Investigators: <u>ZH TP</u>	Landform (hillslope, terrace, etc.): <u>Shoulder Slope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>4</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.896416</u>	Long: <u>-155.463425</u>
Soil Map Unit Name: <u>N/A</u>		Datum: <u>WGS84</u>
	NWI Classification: <u>U</u>	

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>		
Hydric Soil Present? Yes <u> </u> No <u>X</u>		
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>		
Is the Sampled Area within a Wetland?		
Yes <u> </u> No <u>X</u>		
Remarks: Wetland with surface water located approximately 30 feet to the north outside of field checked polygon. Wetter than normal antecedent precipitation.		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				
50% of total cover: <u>0</u>				20% of total cover: <u>0</u>
Dominance Test Worksheet:				
Number of Dominant Species <u> </u>				
That Are OBL, FACW, or FAC: <u>3</u> (A)				
Total Number of Dominant Species Across All Strata: <u>3</u> (B)				
Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)				
Prevalence Index worksheet:				
Total % Cover of: <u> </u> Multiply by: <u> </u>				
OBL species <u> </u> x1= <u> </u>				
FACW species <u> </u> x2= <u> </u>				
FAC species <u>75</u> x3= <u>225</u>				
FACU species <u>12</u> x4= <u>48</u>				
UPL species <u>4</u> x5= <u>20</u>				
Column Totals: <u>91</u> (A) <u>293</u> (B)				
Prevalence Index = B/A= <u>3.22</u>				
Hydrophytic Vegetation Indicators:				
X Dominance Test is >50%				
<u> </u> Prevalence Index is ≤3.0				
<u> </u> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)				
<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>				

<u>Sapling/Shrub Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Vaccinium uliginosum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Empetrum nigrum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Betula nana</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
4. <u>Loiseleuria procumbens</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
5. <u>Salix phlebophylla</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
6. <u>Ledum decumbens</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>74</u>				
50% of total cover: <u>37</u>				20% of total cover: <u>14.8</u>
Herb Stratum				
1. <u>Carex bigelowii</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
3. <u>Sedum rosea ssp. integrifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
4. <u>Anemone narcissiflora</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
5. <u>Lycopodium annotinum s.l.</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
6. <u>Hierochloa odorata</u>	<u>1</u>	<u>No</u>	<u>NL</u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>17</u>				
50% of total cover: <u>8.5</u>				20% of total cover: <u>3.4</u>
Plot size (radius, or length x width) <u>20 ft</u> % Bare Ground <u>10</u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u> </u>				
(Where applicable)				

Remarks:

DEST.

Rocks at 10%.

Lichen at 25%.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-3	10YR 2/1	100						Sandy Loam	hor:A
3-13	10YR 4/4	100					No	Sandy Loam	hor:B/C
13-22	10YR 3/2	10					No	Sandy Loam	hor:B/C
13-22	10YR 4/3	90					No	Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: WD - Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X

Remarks: Soil profile not recorded on data form 3PP0015. No hydric soil indicators observed in 2018 data collection.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
(includes capillary fringe)	
	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Soil moist but not saturated. No water marks observed as reported on data form 3PP0015.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1037_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Vaccinium vitis-idaea</u>	<u>3</u>	<u>No</u>	<u>FAC</u>
<u>Dryas octopetala</u>	<u>3</u>	<u>No</u>	<u>NL</u>

Additional Reference Data: Photos

HDR1037_18



Photo Name: Photo_180622161234



Photo Name: Photo_180622161255



Photo Name: Photo_180622161317



Photo Name: Photo_180622161243



Photo Name: Photo_180622161220



Photo Name: Photo_180622161324

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/23/2018
 Applicant/Owner: PLP Sampling Point: HDR1039_18
 Investigators: ZH, TP Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): Convex Slope(%): _____ HGM: N/A
 Subregion (LRR): X Lat: 59.893782 Long: -155.418507 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)
 Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes _____	No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>			
Wetland Hydrology Present?	Yes _____	No <u>X</u>			

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>3</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>65</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	OBL species _____ x1= _____
3. <u>Betula nana</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACW species <u>3</u> x2= <u>6</u>
4. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>128</u> x3= <u>384</u>
5. <u>Ledum decumbens</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FACU species <u>7</u> x4= <u>28</u>
6. <u>Vaccinium vitis-idaea</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	UPL species _____ x5= _____
Total Cover: <u>109</u>				Column Totals: <u>138</u> (A) <u>418</u> (B)
50% of total cover: <u>54.5</u>				Prevalence Index = B/A= <u>3.03</u>
20% of total cover: <u>21.8</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Polygonum bistorta ssp. plumosum</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Rubus chamaemorus</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
5. <u>Cornus suecica</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sedum rosea ssp. integrifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
7. <u>Epilobium angustifolium</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>29</u>				
50% of total cover: <u>14.5</u>				
20% of total cover: <u>5.8</u>				
Plot size (radius, or length x width) <u>10 ft</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes _____				
(Where applicable)				

Remarks: DEST-H.
Lichen 5%

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-6									hor:Oi
6-8									hor:Oe
8-9	10YR 2/1	100					No	Silt Loam	hor:A
9-18	7.5YR 3/2	100					No	Sandy Loam	hor:A/B
18-23	7.5YR 3/3	20					No	Sandy Loam	hor:A/B
18-23	7.5YR 3/2	80					No	Sandy Loam	hor:A/B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes No X
Type: None		
Depth (inches):		
Field Drainage Class: MWD - Moderately Well Drained		

Remarks: Does not meet histic epipedon, not saturated and not likely to be saturated. Heavy recent precipitation.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes No X
Surface Water Present? Yes No X Depth (inches):		
Water Table Present? Yes X No Depth (inches): 21.0		
Saturation Present? Yes X No Depth (inches): 19.0		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No indications of overland flooding from nearby stream.

Geomorphic Position: Toeslope

Additional Reference Data: Overflow Vegetation

HDR1039_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Spiraea stevenii</u>	<u>3</u>	<u>No</u>	<u>FACU</u>

Additional Reference Data: Photos

HDR1039_18



Photo Name: Photo_180623083827



Photo Name: Photo_180623083805

Additional Reference Data: Photos

HDR1039_18



Photo Name: Photo_180623083738



Photo Name: Photo_180623083751



Photo Name: Photo_180623083721



Photo Name: Photo_180623083835

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/23/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1040_18</u>	
Investigators: <u>ZH TP</u>	Landform (hillslope, terrace, etc.): _____	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>4</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.893772</u>	Long: <u>-155.419747</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Bluejoint Herb (BH)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)

Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>7</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>57</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> _____ <u>Multiply by:</u> _____
1. <u>Salix pulchra</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	OBL species _____ x1= _____
2. <u>Spiraea stevenii</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	FACW species <u>15</u> x2= <u>30</u>
3. _____	_____	_____	_____	FAC species <u>69</u> x3= <u>207</u>
4. _____	_____	_____	_____	FACU species <u>47</u> x4= <u>188</u>
5. _____	_____	_____	_____	UPL species _____ x5= _____
6. _____	_____	_____	_____	Column Totals: <u>131</u> (A) <u>425</u> (B)
Total Cover: <u>18</u>				<u>Prevalence Index = B/A=</u> <u>3.24</u>
50% of total cover: <u>9</u>				
20% of total cover: <u>3.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Epilobium angustifolium</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Aconitum delphinifolium</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Geranium erianthum</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Gymnocarpium dryopteris</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	
7. <u>Rubus arcticus s.l.</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Veratrum viride</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Viola langsdoeffii</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
10. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>115</u>				
50% of total cover: <u>57.5</u>				
20% of total cover: <u>23</u>				
Plot size (radius, or length x width) <u>15 ft</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes _____ % Cover of Bryophytes <u>35</u>				Yes <u>X</u> No _____
(Where applicable)				Present?
Remarks:				
BH				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-3	10YR 4/4	100					No	Sandy Loam	hor:B/C Fsal0
3-4	7.5YR 3/2	100					No	Silt Loam	hor:Ab
4-10	10YR 4/4	100					No	Sandy Loam	hor:B/C Vfsalo
10-15	10YR 4/3	100					No	Sandy Loam	hor:B/C Vfsalo 20% Gravel
15-22	10YR 4/3	100					No	Loam	hor:B/C Gravelly Loam

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: WD - Well Drained	Hydric Soil Present? Yes _____ No _____ X _____
---	--

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Microtopographic Relief (D4)
	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No _____ X _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ X _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ X _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____ X _____
---	--

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Soil profile moist but not saturated. No indication of overland flooding from stream. Plot approximately 4 feet higher than stream.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1040_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Pyrola grandiflora	3	No	FAC
Anqelica lucida	3	No	FACU
Anemone richardsonii	1	No	FAC
Cornus suecica	1	No	FAC
Sedum rosea ssp. integrifolium	1	No	FAC
Achillea millefolium s.l.	1	No	FACU
Carex sp.	1	No	N/A
Senecio sp.	1	No	NULL

Additional Reference Data: Photos

HDR1040_18



Photo Name: Photo_180623093604



Photo Name: Photo_180623093559

Additional Reference Data: Photos

HDR1040_18



Photo Name: Photo_180623093529



Photo Name: Photo_180623093543



Photo Name: Photo_180623093518



Photo Name: Photo_180623093505

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	6/23/2018
Applicant/Owner:	PLP			Sampling Point:	HDR1041_18
Investigators:	ZH TP	Landform (hillslope, terrace, etc.):	Terrace		
Local Relief (concave, convex, none):	Concave	Slope(%):	4	HGM:	N/A
Subregion (LRR):	X	Lat:	59.894730	Long:	-155.421249
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	U		

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-5	10YR 4/4	100					No	Sandy Loam	hor:B/C Vfsalo
5-8	7.5YR 3/2	100					No	Silt Loam	hor:Ab
8-17	10YR 4/3	80	5YR 4/6	20	C		No	Sandy Loam	hor:B/C
17-20	7.5YR 3/3	100					No	Loam	hor:C Gravelly Loam

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present): Type: <u>None</u> Depth (inches): _____ Field Drainage Class: <u>SPD - Somewhat Poorly Drained</u>	Hydric Soil Present? Yes _____ No _____ <u>X</u>
--	---

Remarks: Strong redox but soil does not meet hydro indicators.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No _____ <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No _____ <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No _____ <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____ <u>X</u>
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Directionally matted senescent Cal can indicates this site periodically floods from nearby stream, likely during breakup. Plot located near bend in creek. Dry soil pit even though above normal antecedent precipitation.

Geomorphic Position:

Additional Reference Data: Photos

HDR1041_18



Photo Name: Photo_180623102123



Photo Name: Photo_180623102217



Photo Name: Photo_180623102134



Photo Name: Photo_180623102208



Photo Name: Photo_180623102149



Photo Name: Photo_180623102109

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/23/2018
 Applicant/Owner: PLP Sampling Point: HDR1044_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Floodplain
 Local Relief (concave, convex, none): Concave Slope(%): 1 HGM: Slope
 Subregion (LRR): X Lat: 59.896095 Long: -155.424576 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PEM1C

Vegetation Type: Subarctic Sedge – Moss Wet Meadow (SSMWM)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u>30</u> <u>Multiply by:</u> <u> </u>
2. <u>Salix pulchra</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>30</u> x1= <u>30</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u> </u> x2= <u> </u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>30</u> x3= <u>90</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u> </u> x4= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>20</u>				Column Totals: <u>60</u> (A) <u>120</u> (B)
50% of total cover: <u>10</u>				<u>Prevalence Index = B/A=</u> <u>2.00</u>
20% of total cover: <u>4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex aquatilis</u>	<u>30</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>40</u>				
50% of total cover: <u>20</u>				
20% of total cover: <u>8</u>				
Plot size (radius, or length x width) <u>10 ft</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>70</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u> </u>				Present?
(Where applicable)				

Remarks: SSMWM

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-6									hor:Oi
6-11									hor:Oe
11-16	10Y 4/1	85	7.5YR 4/4	15	C	PL		Silt Loam	hor:Bg

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input checked="" type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input checked="" type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type:			Yes	<input checked="" type="checkbox"/> X	No
Depth (inches):	N/A				
Field Drainage Class:	VPD - Very Poorly Drained				

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)					
<input checked="" type="checkbox"/> Surface Water (A1)		<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input checked="" type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input type="checkbox"/> Microtopographic Relief (D4)		
			<input checked="" type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	2.0	
Water Table Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	1.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	0.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water located in low spots. Seeps located within polygon.

Geomorphic Position: Floodplain



Photo Name: Photo_180623112141



Photo Name: Photo_180623112156



Photo Name: Photo_180623112131



Photo Name: Photo_180623112109



Photo Name: Photo_180623112120



Photo Name: Photo_180623112150

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/23/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1045_18</u>	
Investigators: <u>ZH TP</u>	Landform (hillslope, terrace, etc.): _____	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>3</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.894005</u>	Long: <u>-155.427643</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)</u>		NWI Classification: <u>U_PUBH</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)

Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>		
Wetland Hydrology Present? Yes _____ No <u>X</u>		

Remarks: Plot on top of DEST hummock. Small pools located in bottoms of deep hummocks, unvegetated indicating prolonged inundation. Mosaic of upland DEST and small waterbodies PUBH. Area determined to be 33% waters measured by transect. Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
<u>Tree Stratum</u>				Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>2</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		That Are OBL, FACW, or FAC: <u>100</u> (A/B)
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> _____ <u>Multiply by:</u> _____
2. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	OBL species _____ x1= _____
3. <u>Vaccinium uliginosum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FACW species <u>1</u> x2= <u>2</u>
4. <u>Vaccinium vitis-idaea</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FAC species <u>103</u> x3= <u>309</u>
5. <u>Salix pulchra</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	FACU species _____ x4= _____
6. <u>Andromeda polifolia</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	UPL species _____ x5= _____
Total Cover: <u>83</u>				Column Totals: <u>104</u> (A) <u>311</u> (B)
50% of total cover: <u>41.5</u>		20% of total cover: <u>16.6</u>		<u>Prevalence Index = B/A=</u> <u>2.99</u>
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Sedum rosea ssp. integrifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. _____	_____	_____	_____	Morphological Adaptations ¹ (Provide
4. _____	_____	_____	_____	data in Remarks or on a separate sheet)
5. _____	_____	_____	_____	Problematic Hydrophytic Vegetation ¹ (Explain)
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology
8. _____	_____	_____	_____	must be present, unless disturbed or problematic.
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>21</u>				
50% of total cover: <u>10.5</u>		20% of total cover: <u>4.2</u>		
Plot size (radius, or length x width) <u>10 ft</u>		% Bare Ground _____		Hydrophytic
% Cover of Wetland Bryophytes _____		% Cover of Bryophytes _____		Vegetation
(Where applicable)				Yes <u>X</u> No _____
				Present?

Remarks:

Vegetation represents tops of hummocks. Surface water in low parts of hummocks not included.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-5									hor:Oe
5-17	5YR 2.5/2	100					No	Loam	hor:A/B Gravelly Loam
17-23	10YR 4/4	100					No	Loam	hor:B/C Gravelly Loam

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			
Type:	None		
Depth (inches):	N/A		
Field Drainage Class:	WD - Well Drained		
		Hydric Soil Present?	Yes _____ No _____ X _____

Remarks: No redox observed. No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:					
Surface Water Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches):		
Water Table Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Depth (inches):	18.0	
Saturation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Depth (inches):	14.0	
(includes capillary fringe)			Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input type="checkbox"/> X <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Not saturated in upper 12 inches of soil profile. Adjacent small pools part of upland/waterbody mosaic.

Geomorphic Position:



Photo Name: Photo_180623125109



Photo Name: Photo_180623125122



Photo Name: Photo_180623125244



Photo Name: Photo_180623125250



Photo Name: Photo_180623125224



Photo Name: Photo_180623125142

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/23/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1046_18</u>	
Investigators: <u>ZH TP</u>	Landform (hillslope, terrace, etc.): _____	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>3</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.894138</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PEM1C</u>	

Vegetation Type: Subarctic Sedge – Moss Wet Meadow (SSMWM)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)

Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____		
Wetland Hydrology Present? Yes <u>X</u> No _____		

Remarks: Emergent wetland inclusion visible on aerial imagery to be mapped as individual polygon not part of mosaic. Marked on field map. Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>50</u> x1= <u>50</u> FACW species _____ x2= _____ FAC species <u>17</u> x3= <u>51</u> FACU species _____ x4= _____ UPL species _____ x5= _____ Column Totals: <u>67</u> (A) <u>101</u> (B) Prevalence Index = B/A= <u>1.51</u>
50% of total cover: <u>0</u>	_____	20% of total cover: <u>0</u>	_____	
Sapling/Shrub Stratum				
1. <u>Salix pulchra</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Vaccinium uliginosum</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
Total Cover: <u>6</u>	_____	_____	_____	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
50% of total cover: <u>3</u>	_____	20% of total cover: <u>1.2</u>	_____	
Herb Stratum				
1. <u>Carex aquatilis</u>	<u>50</u>	<u>Yes</u>	<u>OBL</u>	
2. <u>Equisetum arvense</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
3. <u>Sedum rosea ssp. integrifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>61</u>	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
50% of total cover: <u>30.5</u>	_____	20% of total cover: <u>12.2</u>	_____	
Plot size (radius, or length x width) <u>10 ft</u>	_____	% Bare Ground <u>0</u>	_____	
% Cover of Wetland Bryophytes <u>50</u>	_____	% Cover of Bryophytes _____	_____	
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-10									hor:Oe
10-20	10YR 2/1	100						Silt Loam	hor:A

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <u> X </u> No <u> </u>
Type:	<u>None</u>	
Depth (inches):	<u> </u>	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> Surface Water (A1)		<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Iron Deposits (B5)			<input checked="" type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input checked="" type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations:			Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No
Surface Water Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):			
Water Table Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):			
Saturation Present? (includes capillary fringe)	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):			

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Ponded surface water in plot.

Geomorphic Position:



Photo Name: Photo_180623131341



Photo Name: Photo_180623131312



Photo Name: Photo_180623131238

Additional Reference Data: Photos

HDR1046_18



Photo Name: Photo_180623131219



Photo Name: Photo_180623131250



Photo Name: Photo_180623131336

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/23/2018
 Applicant/Owner: PLP Sampling Point: HDR1049_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Footslope
 Local Relief (concave, convex, none): Concave Slope(%): 3 HGM: N/A
 Subregion (LRR): X Lat: 59.892508 Long: -155.430811 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Empetrum nigrum</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Betula nana</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACW species <u>11</u> x2= <u>22</u>
3. <u>Spiraea stevenii</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	FAC species <u>106</u> x3= <u>318</u>
4. <u>Vaccinium uliginosum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>11</u> x4= <u>44</u>
5. <u>Vaccinium vitis-idaea</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
6. <u>Andromeda polifolia</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	Column Totals: <u>128</u> (A) <u>384</u> (B)
Total Cover: <u>94</u>				<u>Prevalence Index = B/A=</u> <u>3.00</u>
50% of total cover: <u>47</u>				
20% of total cover: <u>18.8</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Rubus chamaemorus</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Veratrum viride</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Dryopteris expansa</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>34</u>				
50% of total cover: <u>17</u>				
20% of total cover: <u>6.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u> </u>				Yes <u>X</u> No <u> </u>
(Where applicable)				Present?

Remarks:
 DEST-H

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-24	5YR 2.5/1	60					No	Silt Loam	hor:A
2-24	5YR 3/2	40					No	Silt Loam	hor:A

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: WD - Well Drained					

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	No	X
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
Water Table Present? Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):	22.0			
Saturation Present? Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):	19.0			
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Soil above 19" moist but not saturated.

Geomorphic Position:



Photo Name: Photo_180623143143



Photo Name: Photo_180623143155



Photo Name: Photo_180623143116



Photo Name: Photo_180623143222



Photo Name: Photo_180623143228



Photo Name: Photo_180623143130

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/23/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1050_18</u>	
Investigators: <u>ZH TP</u>	Landform (hillslope, terrace, etc.): <u>Footslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>2</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.892387</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PEM1C</u>	

Vegetation Type: Subarctic Sedge – Moss Wet Meadow (SSMWM)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		

Remarks: Swale running through DEST-H polygon. Marked on field map, location supported by contours and stream mapping. Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix myrtilifolia</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	<u>Total % Cover of:</u> <u>30</u> <u>Multiply by:</u>
2. <u>Salix pulchra</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>30</u> x1= <u>30</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>15</u> x2= <u>30</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>24</u> x3= <u>72</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u> </u> x4= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>15</u>				Column Totals: <u>69</u> (A) <u>132</u> (B)
50% of total cover: <u>7.5</u>				<u>Prevalence Index = B/A=</u> <u>1.91</u>
20% of total cover: <u>3</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex aquatilis</u>	<u>30</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Sedum rosea ssp. integrifolium</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Veratrum viride</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>54</u>				
50% of total cover: <u>27</u>				
20% of total cover: <u>10.8</u>				
Plot size (radius, or length x width) <u>10 ft</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>80</u>				
% Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks:				
SSMWM				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-10									hor:Oi
10-19									hor:Oe

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input checked="" type="checkbox"/> Histosol or Histel (A1)		<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)		<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)		<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)		³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)		and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)		⁴ Give details of color change in Remarks.	

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No	<input type="checkbox"/>
Type: None						
Depth (inches):						
Field Drainage Class: VPD - Very Poorly Drained						

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> X Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> X FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No	<input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):					
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	0.0				
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	0.0				
(includes capillary fringe)						

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Saturation and water table present at the surface. Some surface water present outside of plot.

Geomorphic Position: Swale



Photo Name: Photo_180623145701



Photo Name: Photo_180623145635



Photo Name: Photo_180623145721

Additional Reference Data: Photos

HDR1050_18



Photo Name: Photo_180623145613



Photo Name: Photo_180623145714



Photo Name: Photo_180623145646

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/23/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1052_18</u>	
Investigators: <u>ZH TP</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>4</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.893501</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NW1 Classification: <u>U</u>	

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>75</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Picea glauca</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	FACW species <u>12</u> x2= <u>24</u>
3. <u>Spiraea stevenii</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	FAC species <u>92</u> x3= <u>276</u>
4. <u>Vaccinium vitis-idaea</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	FACU species <u>23</u> x4= <u>92</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u>3</u> x5= <u>15</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>130</u> (A) <u>407</u> (B)
Total Cover: <u>57</u>				<u>Prevalence Index = B/A=</u> <u>3.13</u>
50% of total cover: <u>28.5</u>				
20% of total cover: <u>11.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Aconitum delphinifolium</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Epilobium angustifolium</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Carex bigelowii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Angelica lucida</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
7. <u>Viola langsdorffii</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Sedum rosea ssp. integrifolium</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Veratrum viride</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
10. <u>Artemisia arctica</u>	<u>3</u>	<u>No</u>	<u>NL</u>	
Total Cover: <u>73</u>				
50% of total cover: <u>36.5</u>				
20% of total cover: <u>14.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				Hydrophytic
% Cover of Wetland Bryophytes <u>10</u> % Cover of Bryophytes <u> </u>				Vegetation
(Where applicable)				Yes <u>X</u> No <u> </u>
Remarks:				Present?
OWLS.				
Willows shorter than plot 1053.				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-5									hor:Oe
5-9	10YR 4/2	100					No	Loam	hor:B/C Gravelly
9-19	2.5Y 4/2	100					No	Sandy Loam	hor:Bg

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: <input type="checkbox"/> None Depth (inches): _____ Field Drainage Class: <input type="checkbox"/> MWD - Moderately Well Drained	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
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Remarks: No redox in 2.5Y horizon.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 5.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 3.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hummocky. FACU herbs growing on tops and bottoms of hummocks.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1052_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Lupinus arcticus	1	No	FACU
Mertensia paniculata	1	No	FACU
Petasites frigidus s.l.	1	No	FACW
Rubus chamaemorus	1	No	FACW

Additional Reference Data: Photos

HDR1052_18



Photo Name: Photo_180623155544



Photo Name: Photo_180623155653

Additional Reference Data: Photos

HDR1052_18



Photo Name: Photo_180623155527



Photo Name: Photo_180623155612



Photo Name: Photo_180623155500



Photo Name: Photo_180623155639

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/24/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1053_18</u>	
Investigators: <u>ZH TP</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>3</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.893738</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NW1 Classification: <u>U</u>	

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>60</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>65</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Spiraea stevenii</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	FACW species <u>13</u> x2= <u>26</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>127</u> x3= <u>381</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>32</u> x4= <u>128</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>172</u> (A) <u>535</u> (B)
Total Cover: <u>68</u>				<u>Prevalence Index = B/A=</u> <u>3.11</u>
50% of total cover: <u>34</u>				
20% of total cover: <u>13.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Angelica lucida</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Epilobium angustifolium</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
5. <u>Aconitum delphinifolium</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Veratrum viride</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
7. <u>Geranium erianthum</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
8. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
9. <u>Rubus arcticus s.l.</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
10. <u>Sedum rosea ssp. integrifolium</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>104</u>				
50% of total cover: <u>52</u>				
20% of total cover: <u>20.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>5</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u> </u>				Present?
(Where applicable)				

Remarks: OWLS.

FACU herbs growing on tops and bottoms of hummocks.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-2									hor:Oe
2-3	7.5YR 2.5/1	100					Yes	Silt Loam	hor:A
3-5							N/A		hor:Oe Buried
5-6	10YR 3/2	100					No	Silt Loam	hor:Ab
6-7							N/A		hor:Oe Buried
7-10	10YR 3/2	100					No	Silt Loam	hor:Ab Ab2
10-12	7.5YR 3/2	100					No	Silt Loam	hor:Ab Ab3

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type: None			Yes	No	X
Depth (inches):					
Field Drainage Class: SPD - Somewhat Poorly Drained					

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)		
<input type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Iron Deposits (B5)			<input checked="" type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input checked="" type="checkbox"/> No	Depth (inches):	1.0	
Water Table Present?	Yes	<input checked="" type="checkbox"/> No	Depth (inches):	16.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> No	Depth (inches):	0.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water table at 16" and rising. Hummocky microtopography. Soil pit saturated from 0 to 9" inches, profile below 9" moist but not saturated. Water seeping into pit from above 9" (episaturation). Approximately 1" surface water in few hummock bottoms. Heavy recent precipitation.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1053_18

	Absolute % Cover	Dominant Species?	Indicator Status
Herb			
Viola epipsila	3	No	FAC
Dryopteris expansa	3	No	FACU
Rubus chamaemorus	3	No	FACW
Cornus canadensis	1	No	FACU

ADDITIONAL REFERENCE DATA: SOIL OVERFLOW

HDR1053_18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
12 - 15	10YR 3/2	100					No	Silt Loam	hor:Ab Ab4
15 - 16	7.5YR 3/3	100					No	Loamy Sand	hor:C
16 - 20	10YR 3/1	30					Yes	Silt Loam	hor:Bg
16 - 20	2.5Y 4/1	70					Yes	Silt Loam	hor:Bg

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Additional Reference Data: Photos

HDR1053_18



Photo Name: Photo_180623162503



Photo Name: Photo_180623162438



Photo Name: Photo_180623162358



Photo Name: Photo_180623162425



Photo Name: Photo_180623162449

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/24/2018
 Applicant/Owner: PLP Sampling Point: HDR1055_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 8 HGM: Slope
 Subregion (LRR): X Lat: 59.890183 Long: -155.464920 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/EM1B

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation.</u>					

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by: <u> </u>
2. <u>Salix reticulata</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>6</u> x1= <u>6</u>
3. <u>Empetrum nigrum</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACW species <u>4</u> x2= <u>8</u>
4. <u>Vaccinium uliginosum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>112</u> x3= <u>336</u>
5. <u>Betula nana</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FACU species <u>8</u> x4= <u>32</u>
6. <u>Spiraea stevenii</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	UPL species <u>1</u> x5= <u>5</u>
Total Cover: <u>76</u>				Column Totals: <u>131</u> (A) <u>387</u> (B)
50% of total cover: <u>38</u>				Prevalence Index = B/A= <u>2.95</u>
20% of total cover: <u>15.2</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Carex microchaeta</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Anemone narcissiflora</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Sanguisorba canadensis</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Carex aquatilis</u>	<u>3</u>	<u>No</u>	<u>OBL</u>	
7. <u>Eriophorum angustifolium</u>	<u>3</u>	<u>No</u>	<u>OBL</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Sedum rosea ssp. integrifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Rubus chamaemorus</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
10. <u>Polygonum sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	
Total Cover: <u>57</u>				
50% of total cover: <u>28.5</u>				
20% of total cover: <u>11.4</u>				
Plot size (radius, or length x width) <u>10 ft</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>5</u>				
% Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks:				
OWLS				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-14									hor:Oe
14-19	7.5YR 2.5/1	100					No	Silt Loam	hor:A Cobbles From 10" To 19".

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
Type: None						
Depth (inches):						
Field Drainage Class: PD - Poorly Drained						

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): 1.0					
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): 9.0					
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (includes capillary fringe)	Depth (inches): 3.0					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water present in seeps within polygon.

Geomorphic Position: Hillside bench

Additional Reference Data: Overflow Vegetation

HDR1055_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Artemisia arctica	1	No	NL
Primula sp.	1	No	NULL

Additional Reference Data: Photos

HDR1055_18



Photo Name: Photo_180624105614



Photo Name: Photo_180624105644



Photo Name: Photo_180624105555



Photo Name: Photo_180624105527



Photo Name: Photo_180624105634



Photo Name: Photo_180624105542

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/24/2018
 Applicant/Owner: PLP Sampling Point: HDR1056_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 6 HGM: N/A
 Subregion (LRR): X Lat: 59.890292 Long: -155.464404 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u> </u>	No <u>X</u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation.</u>					

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>6</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>33</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Salix reticulata</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>5</u> x2= <u>10</u>
4. <u>Vaccinium uliginosum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>84</u> x3= <u>252</u>
5. <u>Vaccinium vitis-idaea</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FACU species <u>29</u> x4= <u>116</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u>25</u> x5= <u>125</u>
Total Cover: <u>68</u>				Column Totals: <u>143</u> (A) <u>503</u> (B)
50% of total cover: <u>34</u>				<u>Prevalence Index = B/A=</u> <u>3.52</u>
20% of total cover: <u>13.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Anemone narcissiflora</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	<u> </u> Dominance Test is >50%
2. <u>Geranium erianthum</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Artemisia arctica</u>	<u>10</u>	<u>Yes</u>	<u>NL</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Lagotis glauca s.l.</u>	<u>10</u>	<u>Yes</u>	<u>NL</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Carex bigelowii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
7. <u>Hierochloe odorata</u>	<u>5</u>	<u>No</u>	<u>NL</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Calamagrostis canadensis</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Sedum rosea ssp. integrifolium</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
10. <u>Veratrum viride</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>75</u>				
50% of total cover: <u>37.5</u>				
20% of total cover: <u>15</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				Hydrophytic Vegetation Yes <u> </u> No <u> </u> X <u> </u>
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				Present?
(Where applicable)				
Remarks: <u>DEST-H</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oe
4-12	7.5 YR 3/3	100					No	Sandy Loam	hor:B/C Gravelly
12-21	10YR 4/4	100						Sandy Loam	hor:C Gravelly

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			
Type: None			
Depth (inches):			
Field Drainage Class: MWD - Moderately Well Drained			
		Hydric Soil Present?	Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>

Remarks: Cobbles at 16".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches):		
Water Table Present? Yes <input type="checkbox"/> X <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):	9.0	
Saturation Present? Yes <input type="checkbox"/> X <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):	4.0	
(includes capillary fringe)		Wetland Hydrology Present? Yes <input type="checkbox"/> X <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Saturated above 12", moist below 12". Episaturation. Water filling pit from this zone.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1056_18

	Absolute % Cover	Dominant Species?	Indicator Status
Herb			
Angelica lucida	3	No	FACU
Lupinus arcticus	3	No	FACU
Lycopodium annotinum s.l.	3	No	FACU
Anemone richardsonii	1	No	FAC
Valeriana sitchensis	1	No	FAC

Additional Reference Data: Photos

HDR1056_18



Photo Name: Photo_180624114232



Photo Name: Photo_180624114220



Photo Name: Photo_180624114157



Photo Name: Photo_180624114146



Photo Name: Photo_180624114238



Photo Name: Photo_180624114209

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/24/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1057_18</u>	
Investigators: <u>ZH TP</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>15</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.888222</u>	Long: <u>-155.462097</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Closed Willow Tall Shrub (CWTS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>67</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>65</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Alnus sinuata</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACW species <u>5</u> x2= <u>10</u>
3. <u>Spiraea stevenii</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	FAC species <u>103</u> x3= <u>309</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>27</u> x4= <u>108</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>135</u> (A) <u>427</u> (B)
Total Cover: <u>81</u>				<u>Prevalence Index = B/A=</u> <u>3.16</u>
50% of total cover: <u>40.5</u>				
20% of total cover: <u>16.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Gymnocarpium dryopteris</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Rubus arcticus s.l.</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
5. <u>Veratrum viride</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Epilobium angustifolium</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Geranium erianthum</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
8. <u>Lycopodium annotinum s.l.</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
9. <u>Angelica lucida</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
10. <u>Cornus canadensis</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>56</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>28</u>				
20% of total cover: <u>11.2</u>				
Plot size (radius, or length x width) <u>15 ft</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks: <u>CWTS</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-4									hor:Oe
4-13	7.5YR 3/2	100					No	Silt Loam	hor:A/B
13-21	10YR 3/2	90	7.5YR 3/4	10	C	M		Sandy Loam	hor:B/C Gravelly

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:
☐ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:
☐ Alaska Color Change (TA4)⁴
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox With 2.5Y Hue

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

☐ Alaska Gleyed Without Hue 5Y or Redder
☐ Underlying Layer
☐ Other (Explain in Remarks)

Restrictive Layer (if present):
Type: None
Depth (inches):
Field Drainage Class: WD - Well Drained

Hydric Soil Present? Yes ☐ No ☐ X ☐

Remarks: Cobbles from 14 to 21".

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)
☐ Surface Water (A1)
☐ High Water Table (A2)
☐ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Marl Deposits (B15)
☐ Hydrogen Sulfide Odor (C1)
☐ Dry Season Water Table (C2)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)
☐ Water-stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ Microtopographic Relief (D4)
☐ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ☐ No ☒ X ☐ Depth (inches):
Water Table Present? Yes ☐ No ☒ X ☐ Depth (inches):
Saturation Present? Yes ☐ No ☒ X ☐ Depth (inches):
(includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☐ X ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary or secondary indicators observed.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1057_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Saxifraga sp.	1	No	N/A
Viola sp.	1	No	N/A

Additional Reference Data: Photos

HDR1057_18



Photo Name: Photo_180624123446



Photo Name: Photo_180624123459

Additional Reference Data: Photos

HDR1057_18



Photo Name: Photo_180624123510



Photo Name: Photo_180624123539



Photo Name: Photo_180624123452



Photo Name: Photo_180624123526

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	6/24/2018
Applicant/Owner:	PLP			Sampling Point:	HDR1059_18
Investigators:	ZH TP	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	None	Slope(%):	5	HGM:	Slope
Subregion (LRR):	X	Lat:	59.888203	Long:	-155.461456
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	PSS1B		

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> X </u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			

Tree Stratum		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:			
1.					Number of Dominant Species			
2.					That Are OBL, FACW, or FAC: 2 (A)			
3.					Total Number of Dominant			
4.					Species Across All Strata: 2 (B)			
Total Cover:					Percent of Dominant Species			
50% of total cover: 0					That Are OBL, FACW, or FAC: 100 (A/B)			
20% of total cover: 0								
Sapling/Shrub Stratum					Prevalence Index worksheet:			
1.	Salix pulchra	80	Yes	FAC	Total % Cover of:		Multiply by:	
2.	Spiraea stevenii	1	No	FACU	OBL species	x1=		
3.					FACW species	6	x2=	12
4.					FAC species	123	x3=	369
5.					FACU species	6	x4=	24
6.					UPL species		x5=	
Total Cover: 81					Column Totals:	135	(A)	405 (B)
50% of total cover: 40.5					Prevalence Index = B/A= 3.00			
20% of total cover: 16.2								
Herb Stratum					Hydrophytic Vegetation Indicators:			
1.	Equisetum arvense	35	Yes	FAC	X	Dominance Test is >50%		
2.	Calamagrostis canadensis	5	No	FAC	X	Prevalence Index is ≤3.0		
3.	Sanguisorba canadensis	5	No	FACW	Morphological Adaptations ¹ (Provide			
4.	Rubus arcticus s.l.	3	No	FAC	data in Remarks or on a separate sheet)			
5.	Mertensia paniculata	3	No	FACU	Problematic Hydrophytic Vegetation ¹ (Explain)			
6.	Cornus canadensis	1	No	FACU				
7.	Moehringia lateriflora	1	No	FACU				
8.	Petasites frigidus s.l.	1	No	FACW				
9.	Saxifraga sp.	1	No	N/A				
10.								
Total Cover: 55								
50% of total cover: 27.5								
20% of total cover: 11								
Plot size (radius, or length x width) 1/10 acre					% Bare Ground 0			
% Cover of Wetland Bryophytes 15					% Cover of Bryophytes			
(Where applicable)								
					Hydrophytic Vegetation Present? Yes X No			

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Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-8									hor:Oe
8-17	7.5 YR 4/2	65	5YR 4/6	35	C	M	No	Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type:			Yes	<input checked="" type="checkbox"/> X	No
Depth (inches):	N/A				
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)					
<input checked="" type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input type="checkbox"/> Microtopographic Relief (D4)		
			<input type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	1.0	
Water Table Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	1.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	0.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Surface water in low areas and drainage patterns.

Geomorphic Position:

Additional Reference Data: Photos

HDR1059_18



Photo Name: Photo_180624132208



Photo Name: Photo_180624132137



Photo Name: Photo_180624132146

Additional Reference Data: Photos

HDR1059_18



Photo Name: Photo_180624132158



Photo Name: Photo_180624132123



Photo Name: Photo_180624132112

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	6/24/2018
Applicant/Owner:	PLP			Sampling Point:	HDR1060_18
Investigators:	ZH TP	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	Concave	Slope(%):	5	HGM:	Slope
Subregion (LRR):	X	Lat:	59.888321	Long:	-155.460632
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	PSS1B		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum				Dominance Test Worksheet:			
		Absolute % Cover	Dominant Species?	Indicator Status			
1.					Number of Dominant Species		
2.					That Are OBL, FACW, or FAC: 4 (A)		
3.					Total Number of Dominant		
4.					Species Across All Strata: 4 (B)		
Total Cover: _____					Percent of Dominant Species		
50% of total cover: 0			20% of total cover: 0		That Are OBL, FACW, or FAC: 100 (A/B)		
Sapling/Shrub Stratum				Prevalence Index worksheet:			
1.	Alnus sinuata	50	Yes	FAC	Total % Cover of: _____ Multiply by: _____		
2.	Salix pulchra	30	Yes	FAC	OBL species _____ x1= _____		
3.					FACW species _____ x2= _____		
4.					FAC species 120 x3= 360		
5.					FACU species 11 x4= 44		
6.					UPL species _____ x5= _____		
Total Cover: 80					Column Totals: 131 (A) 404 (B)		
50% of total cover: 40			20% of total cover: 16		Prevalence Index = B/A= 3.08		
Herb Stratum				Hydrophytic Vegetation Indicators:			
1.	Calamagrostis canadensis	20	Yes	FAC	X Dominance Test is >50%		
2.	Equisetum arvense	15	Yes	FAC	Prevalence Index is ≤3.0		
3.	Viola epipsila	5	No	FAC	Morphological Adaptations ¹ (Provide		
4.	Gymnocarpium dryopteris	5	No	FACU	data in Remarks or on a separate sheet)		
5.	Angelica lucida	3	No	FACU	Problematic Hydrophytic Vegetation ¹ (Explain)		
6.	Cornus canadensis	3	No	FACU			
7.							
8.							
9.							
10.							
Total Cover: 51							
50% of total cover: 25.5			20% of total cover: 10.2				
Plot size (radius, or length x width) 1/10 acre				% Bare Ground 10			
% Cover of Wetland Bryophytes 5		% Cover of Bryophytes					
(Where applicable)							
				Hydrophytic Vegetation Present? Yes X No			

Remarks:

CAWTS

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-5									hor:Oe
5-10	7.5YR 3/1	100					N/A	Silt Loam	hor:A
10-19	7.5YR 4/2	60	5YR 4/6	40	C	M	N/A	Sandy Loam	hor:B/C Redox Also As Pore Linings.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: <u>None</u> Depth (inches): _____ Field Drainage Class: <u>PD - Poorly Drained</u>	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks: H2S at 8 inches.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>1.0</u> Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>11.0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>4.0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Surface water in low areas. H2S at 8". Water in pit at 14 inches and rising to 11 inches at time of photo, continuing to rise.

Geomorphic Position:

Additional Reference Data: Photos

HDR1060_18



Photo Name: Photo_180624141209



Photo Name: Photo_180624141109



Photo Name: Photo_180624141125



Photo Name: Photo_180624141154



Photo Name: Photo_180624141147



Photo Name: Photo_180624141132

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/24/2018
 Applicant/Owner: PLP Sampling Point: HDR1061_18
 Investigators: ZH TP Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Convex Slope(%): 8 HGM: N/A
 Subregion (LRR): X Lat: 59.888813 Long: -155.460892 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Closed Alder – Willow Low Shrub (CAWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation.</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>75</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Alnus sinuata</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Salix pulchra (shrub)</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Spiraea stevenii</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	FACW species <u> </u> x2= <u> </u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>103</u> x3= <u>309</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>32</u> x4= <u>128</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>83</u>				Column Totals: <u>135</u> (A) <u>437</u> (B)
50% of total cover: <u>41.5</u>				Prevalence Index = B/A= <u>3.24</u>
20% of total cover: <u>16.6</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Gymnocarpium dryopteris</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Lycopodium annotinum s.l.</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Rubus stellatus</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Epilobium angustifolium</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
7. <u>Cornus canadensis</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>52</u>				
50% of total cover: <u>26</u>				
20% of total cover: <u>10.4</u>				
Plot size (radius, or length x width) <u>20 ft</u>				
% Bare Ground <u>15</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks: <u>CAWLS</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-3									hor:Oe
3-12	7.5YR 3/3	100					No	Loamy Sand	hor:B/C
12-19	7.5YR 3/2	100					No	Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: MWD - Moderately Well Drained					

Remarks: No hydric soil indicators observed. Cobbles from 4" to 19".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):			
Water Table Present?	Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):	7.0		
Saturation Present?	Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):	4.0		
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Heavy recent rains.

Geomorphic Position:



Photo Name: Photo_180624144734



Photo Name: Photo_180624145516



Photo Name: Photo_180624144713



Photo Name: Photo_180624144720



Photo Name: Photo_180624144725



Photo Name: Photo_180624145531

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	6/24/2018
Applicant/Owner:	PLP			Sampling Point:	HDR1064_18
Investigators:	ZH TP	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	Convex	Slope(%):	10	HGM:	N/A
Subregion (LRR):	X	Lat:	59.888774	Long:	-155.461714
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	U		

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		

Tree Stratum				Dominance Test Worksheet:			
		Absolute % Cover	Dominant Species?	Indicator Status	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)		
1.					Total Number of Dominant Species Across All Strata: <u>2</u> (B)		
2.					Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)		
3.					Prevalence Index worksheet:		
4.					Total % Cover of: <u> </u> Multiply by: <u> </u>		
Total Cover:					OBL species <u> </u> x1= <u> </u>		
50% of total cover:		<u>0</u>	20% of total cover:	<u>0</u>	FACW species <u>1</u> x2= <u>2</u>		
					FAC species <u>95</u> x3= <u>285</u>		
					FACU species <u>54</u> x4= <u>216</u>		
					UPL species <u> </u> x5= <u> </u>		
					Column Totals: <u>150</u> (A) <u>503</u> (B)		
				<i>Prevalence Index = B/A=</i> <u>3.35</u>			
Sapling/Shrub Stratum				Hydrophytic Vegetation Indicators:			
1.	Alnus sinuata	80	Yes	FAC	Dominance Test is >50%		
2.					Prevalence Index is ≤3.0		
3.					Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet)		
4.					Problematic Hydrophytic Vegetation ¹ (Explain)		
5.					¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.		
6.							
Total Cover:		<u>80</u>	20% of total cover:	<u>16</u>			
50% of total cover:		<u>40</u>					
				Hydrophytic Vegetation Present?			
				Yes <u> </u> No <u> </u> X <u> </u>			
Herb Stratum							
1.	Gymnocarpium dryopteris	50	Yes	FACU			
2.	Calamagrostis canadensis	10	No	FAC			
3.	Veratrum viride	5	No	FAC			
4.	Angelica lucida	3	No	FACU			
5.	Streptopus amplexifolius	1	No	FACU			
6.	Sanguisorba canadensis	1	No	FACW			
7.							
8.							
9.							
10.							
Total Cover:		<u>70</u>	20% of total cover:	<u>14</u>			
50% of total cover:		<u>35</u>					
Plot size (radius, or length x width) <u>1/10 acre</u>				% Bare Ground			
% Cover of Wetland Bryophytes <u>0</u>				% Cover of Bryophytes			
(Where applicable)							

Remarks:
CATS

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-17	7.5YR 3/3	100					No	Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: <input type="checkbox"/> None Depth (inches): _____ Field Drainage Class: <input type="checkbox"/> WD - Well Drained	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
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Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> X <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): 17.0 Saturation Present? Yes <input type="checkbox"/> X <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): 15.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No saturation in upper 12 inches of soil profile. No primary or secondary indicators observed.

Geomorphic Position:



Photo Name: Photo_180624155438



Photo Name: Photo_180624155521



Photo Name: Photo_180624155453

Additional Reference Data: Photos

HDR1064_18



Photo Name: Photo_180624155516



Photo Name: Photo_180624155447



Photo Name: Photo_180624155501

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/7/2018
 Applicant/Owner: PLP Sampling Point: HDR1070_18
 Investigators: ZH MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 4 HGM: N/A
 Subregion (LRR): X Lat: 59.895901 Long: -155.409958 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	

Remarks: Upland DEST-H. Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>65</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Betula nana</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACW species <u>1</u> x2= <u>2</u>
4. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>116</u> x3= <u>348</u>
5. <u>Spiraea stevenii</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	FACU species <u>2</u> x4= <u>8</u>
6. <u>Rhododendron tomentosum</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>108</u>				Column Totals: <u>119</u> (A) <u>358</u> (B)
50% of total cover: <u>54</u>				Prevalence Index = B/A= <u>3.01</u>
20% of total cover: <u>21.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	X Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>2</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Carex microchaeta</u>	<u>2</u>	<u>Yes</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Rhodiola integrifolia</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Carex stylosa</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>11</u>				
50% of total cover: <u>5.5</u>				
20% of total cover: <u>2.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u> </u>				
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-5									hor:Oe
5-8	10YR 2/1	100					No	Sandy Loam	hor:A Gravelly
8-19	7.5YR 2.5/2	100					No	Sandy Loam	hor:B/C Gravelly

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: WD - Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Microtopographic Relief (D4)
	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
(includes capillary fringe)	
	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No saturation to 19".

Geomorphic Position:

Additional Reference Data: Photos

HDR1070_18



Photo Name: Photo_180707085125



Photo Name: Photo_180707085150



Photo Name: Photo_180707085116

Additional Reference Data: Photos

HDR1070_18



Photo Name: Photo_180707085135



Photo Name: Photo_180707085032



Photo Name: Photo_180707085040

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/7/2018
 Applicant/Owner: PLP Sampling Point: HDR1071_18
 Investigators: ZH MD Landform (hillslope, terrace, etc.): _____
 Local Relief (concave, convex, none): Concave Slope(%): 2 HGM: Slope
 Subregion (LRR): X Lat: 59.895714 Long: -155.409180 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/EM1B

Vegetation Type: Subarctic Sedge – Moss Wet Meadow (SSMWM)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)
 Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____		
Wetland Hydrology Present?	Yes <u>X</u>	No _____		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>4</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
Sapling/Shrub Stratum				Total % Cover of:
1. <u>Salix fuscescens</u>	<u>25</u>	<u>Yes</u>	<u>FACW</u>	<u>65</u> x1= <u>65</u>
2. <u>Betula nana</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>33</u> x2= <u>66</u>
3. <u>Vaccinium uliginosum</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>37</u> x3= <u>111</u>
4. <u>Empetrum nigrum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u>2</u> x4= <u>8</u>
5. <u>Spiraea stevenii</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	_____ x5= _____
6. <u>Salix pulchra</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	Column Totals: <u>137</u> (A) <u>250</u> (B)
Total Cover: <u>53</u>				Prevalence Index = B/A = <u>1.82</u>
50% of total cover: <u>26.5</u>				
20% of total cover: <u>10.6</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Carex pluriflora</u>	<u>50</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex aquatilis</u>	<u>15</u>	<u>No</u>	<u>OBL</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Rubus chamaemorus</u>	<u>7</u>	<u>No</u>	<u>FACW</u>	Morphological Adaptations ¹ (Provide
4. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Cornus suecica</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
7. <u>Carex bigelowii</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
8. <u>Sanguisorba canadensis</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>84</u>				
50% of total cover: <u>42</u>				
20% of total cover: <u>16.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground _____				
% Cover of Wetland Bryophytes _____ % Cover of Bryophytes _____				
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-18									hor:Oe

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> No
Type: None				
Depth (inches):				
Field Drainage Class: PD - Poorly Drained				

Remarks: Deep saturated organics.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> No
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):			
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	5.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	3.0		
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Water weeping into pit at 5" but not yet filled.
Geomorphic Position: Depressional area on gentle hillslope.

Additional Reference Data: Photos

HDR1071_18



Photo Name: Photo_180707094436



Photo Name: Photo_180707094419



Photo Name: Photo_180707094427

Additional Reference Data: Photos

HDR1071_18



Photo Name: Photo_180707094404



Photo Name: Photo_180707094355



Photo Name: Photo_180707094448

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/7/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1072_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>10</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u> Lat: <u>59.896088</u>	Long: <u>-155.408279</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>75</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>55</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Spiraea stevenii</u>	<u>7</u>	<u>No</u>	<u>FACU</u>	FACW species <u>11</u> x2= <u>22</u>
3. <u>Betula nana</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FAC species <u>104</u> x3= <u>312</u>
4. <u>Vaccinium uliginosum</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FACU species <u>27</u> x4= <u>108</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>142</u> (A) <u>442</u> (B)
Total Cover: <u>67</u>				<u>Prevalence Index = B/A=</u> <u>3.11</u>
50% of total cover: <u>33.5</u>				
20% of total cover: <u>13.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Dryopteris expansa</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Veratrum viride</u>	<u>8</u>	<u>Yes</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Sanguisorba canadensis</u>	<u>7</u>	<u>No</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
5. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Chamaenerion angustifolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
7. <u>Geranium erianthum</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Rubus chamaemorus</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	must be present, unless disturbed or problematic.
9. <u>Anemone richardsonii</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
10. <u>Equisetum sylvaticum</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>75</u>				Hydrophytic
50% of total cover: <u>37.5</u>				Vegetation
20% of total cover: <u>15</u>				Yes <u>X</u> No <u> </u>
Plot size (radius, or length x width) <u>10 x 35 ft</u>				Present?
% Cover of Wetland Bryophytes <u>30</u> % Cover of Bryophytes <u>40</u>				
(Where applicable)				

Remarks:

Trace: Car big, Luz par, Vah atr, Poa arc, Fri cha, Eri per, Str amp, Mic nel, Rho int, Ver wor, Pol acu, Val cap, Lis cor, Her max, Ang luc, Tri eur, Epi hor, Aco del, Ach mil, Vio epi.

Overall poly is OWLS.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-13									hor:Oe
13-19	10YR 2/2	100					Yes	Silt Loam	hor:A

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			
Type: None			
Depth (inches):			
Field Drainage Class: PD - Poorly Drained			
		Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks: H2S at 8 inches.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 1.0		
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 4.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 2.0 (includes capillary fringe)		
	Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position: Toeslope with wetlands upgradient. Drainage patterns and low areas with one inch surface water observed.

Additional Reference Data: Overflow Vegetation

HDR1072_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Athyrium cyclosorum	1	No	FAC
Carex podocarpa	1	No	FAC
Senecio triangularis	1	No	FACW

Additional Reference Data: Photos

HDR1072_18



Photo Name: Photo_180707110228



Photo Name: Photo_180707110241

Additional Reference Data: Photos

HDR1072_18



Photo Name: Photo_180707110300



Photo Name: Photo_180707110320



Photo Name: Photo_180707110327



Photo Name: Photo_180707110340

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/7/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1073_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>Convex</u>	Slope(%): <u>9</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.896404</u>	Long: <u>-155.408829</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Bluejoint Herb (BH)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>7</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>57</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Salix pulchra</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Spiraea stevenii</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	FACW species <u>25</u> x2= <u>50</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>97</u> x3= <u>291</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>69</u> x4= <u>276</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u>2</u> x5= <u>10</u>
Total Cover: <u>45</u>				Column Totals: <u>193</u> (A) <u>627</u> (B)
50% of total cover: <u>22.5</u>				<u>Prevalence Index = B/A=</u> <u>3.25</u>
20% of total cover: <u>9</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Chamaenerion angustifolium</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Gymnocarpium dryopteris</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Sanguisorba canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
5. <u>Festuca altaica</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Achillea millefolium s.l.</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	
7. <u>Geranium erianthum</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	
8. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
9. <u>Viola langsdoeffii</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	must be present, unless disturbed or problematic.
10. <u>Carex podocarpa</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>148</u>				
50% of total cover: <u>74</u>				
20% of total cover: <u>29.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Cover of Wetland Bryophytes <u>0</u>				Vegetation
% Cover of Bryophytes <u>25</u>				Yes <u>X</u> No <u> </u>
(Where applicable)				Present?

Remarks:

Trace: Vac vit, Vac uli, Poa arc, Vah atr, Luz mul, Car sci, Phl alp, Str amp, Ver vir, Pol acu, Ane nar, Pet fri, Aco del, Sen lug, Gal bor, Ped ver, Rum ace, Car umb, Lup noo, Moe lat, Lyc ann, Rho int, Epi hor, Vio epi, Dip alp, lichen.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-20	7.5YR 3/3	100					No	Very Fine Sandy	hor:A/B Few small cobbles

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: None Depth (inches): Field Drainage Class: WD - Well Drained	Hydric Soil Present? Yes No X
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Remarks: Profile moist but not saturated. No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes No X Depth (inches): Water Table Present? Yes No X Depth (inches): Saturation Present? Yes No X Depth (inches): (includes capillary fringe)	Wetland Hydrology Present? Yes No X
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No saturation observed to 20".

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1073_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Rubus stellatus	3	No	FAC
Erigeron peregrinus	3	No	FACW
Anemone richardsonii	2	No	FAC
Fritillaria camschatcensis	2	No	FAC
Pyrola asarifolia	2	No	FACU
Senecio trianqualaris	2	No	FACW
Artemisia arctica	2	No	NL
Cerastium beeringianum	1	No	FAC
Luzula parviflora	1	No	FAC
Angelica lucida	1	No	FACU
Trientalis europaea	1	No	FACU

Additional Reference Data: Photos

HDR1073_18



Photo Name: Photo_180707112433



Photo Name: Photo_180707112423

Additional Reference Data: Photos

HDR1073_18



Photo Name: Photo_180707112412



Photo Name: Photo_180707112401



Photo Name: Photo_180707112448



Photo Name: Photo_180707112500

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/7/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1075_18</u>	
Investigators: <u>ZH MSD</u>	Landform (hillslope, terrace, etc.): <u>Valleybottom</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>4</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.897038</u>	Long: <u>-155.409927</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Open Willow Low Shrub (OWLS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>80</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Empetrum nigrum</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>25</u> x2= <u>50</u>
3. <u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	FAC species <u>90</u> x3= <u>270</u>
4. <u>Vaccinium uliginosum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FACU species <u>24</u> x4= <u>96</u>
5. <u>Vaccinium vitis-idaea</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
6. <u>Salix barclayi</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	Column Totals: <u>139</u> (A) <u>416</u> (B)
Total Cover: <u>56</u>				<u>Prevalence Index = B/A=</u> <u>2.99</u>
50% of total cover: <u>28</u>				
20% of total cover: <u>11.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Sanguisorba canadensis</u>	<u>25</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Geranium erianthum</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Calamagrostis canadensis</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Carex podocarpa</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Rubus stellatus</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
7. <u>Achillea millefolium s.l.</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Veratrum viride</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Chamaenerion angustifolium</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
10. <u>Rhodiola integrifolia</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>83</u>				
50% of total cover: <u>41.5</u>				
20% of total cover: <u>16.6</u>				
Plot size (radius, or length x width) <u>15 x 40 ft</u>				Hydrophytic
% Cover of Wetland Bryophytes <u>5</u>				Vegetation
% Cover of Bryophytes <u>40</u>				Yes <u>X</u> No <u> </u>
(Where applicable)				Present?

Remarks: Trace: Bet nan, Sal fus, Luz par, Vah atr, Poa arc, Car lach, Art arc, Car pra, Vio lan, Aco del, Val cap, Dry exp, Pet fri, Pol acu, Tri eur, Pyr min, Ane ric, Epi hor, Lyc ann, Lis cor, lichen.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-4	7.5YR 3/2	100					No	Fine Sandy Loam	hor:A
4-6	10YR 3/3	100					No	Loamy Sand	hor:B/C Gravelly
6-19	7.5YR 2.5/2	100					No	Loamy Sand	hor:B/C Gravelly

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: <input type="checkbox"/> None Depth (inches): _____ Field Drainage Class: <input type="checkbox"/> WD - Well Drained	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
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Remarks: No hydric soil indicators observed. Profile moist but not saturated. Few small cobbles from 6" to 19".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No saturation to 19". No indication of overbank flooding observed from nearby stream. Slope to south is much more gentle than slope to north across the stream.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1075_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Viola epipsila	1	No	FAC
Angelica lucida	1	No	FACU

Additional Reference Data: Photos

HDR1075_18



Photo Name: Photo_180707130242



Photo Name: Photo_180707130256

Additional Reference Data: Photos

HDR1075_18



Photo Name: Photo_180707130146



Photo Name: Photo_180707130229



Photo Name: Photo_180707130206



Photo Name: Photo_180707130313

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/7/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1076_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>Convex</u>	Slope(%): <u>5</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.898006</u>	Long: <u>-155.411072</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
NW1 Classification: <u>U</u>		

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>		
Hydric Soil Present? Yes <u> </u> No <u>X</u>		
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>		
Is the Sampled Area within a Wetland?		
Yes <u> </u> No <u>X</u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet: <u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u> OBL species <u> </u> x1= <u> </u> FACW species <u>16</u> x2= <u>32</u> FAC species <u>100</u> x3= <u>300</u> FACU species <u>4</u> x4= <u>16</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>120</u> (A) <u>348</u> (B) <i>Prevalence Index = B/A=</i> <u>2.90</u>
1. <u>Empetrum nigrum</u>	35	Yes	FAC	
2. <u>Vaccinium uliginosum</u>	30	Yes	FAC	
3. <u>Salix pulchra</u>	10	No	FAC	
4. <u>Spiraea stevenii</u>	3	No	FACU	
5. <u>Betula nana</u>	2	No	FAC	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>80</u>				
50% of total cover: <u>40</u>		20% of total cover: <u>16</u>		
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators: X Dominance Test is >50% X Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Sanguisorba canadensis</u>	15	Yes	FACW	
2. <u>Calamagrostis canadensis</u>	6	Yes	FAC	
3. <u>Equisetum arvense</u>	5	No	FAC	
4. <u>Carex podocarpa</u>	4	No	FAC	
5. <u>Carex bigelowii</u>	3	No	FAC	
6. <u>Veratrum viride</u>	3	No	FAC	
7. <u>Rhodiola integrifolia</u>	1	No	FAC	
8. <u>Rubus stellatus</u>	1	No	FAC	
9. <u>Angelica lucida</u>	1	No	FACU	
10. <u>Viola langsdorffii</u>	1	No	FACW	
Total Cover: <u>40</u>				
50% of total cover: <u>20</u>		20% of total cover: <u>8</u>		
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u> </u>		% Cover of Bryophytes <u> </u>		
(Where applicable)				
Remarks: <u>Trace: Vac vit, Sal fus, Aln sin, Luz par, Luz mul, Cha ang, Str amp, Ped sud, Val cap, Equ pra, Ach mil, Art arc, Aco del, Pet fri, Eri per, Ane ric, Ang gen, Pyr asa, Car pra, Tri eur, Pyr min, Epi hor, Bis viv, Ste sit, Ane nar, Lis cor, lichen.</u>				
Hydrophytic Vegetation Present?				Yes <u>X</u> No <u> </u>

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-9	10YR 2/2	30					No	Sandy Loam	hor:A/B Gravelly
4-9	10YR 3/3	70					No	Sandy Loam	hor:A/B Gravelly
9-17	7.5YR 3/3	100					No	Loamy Sand	hor:B/C *4

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: WD - Well Drained	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X

Remarks: No hydric soil indicators observed. *4: Gravelly. Refusal on cobbles at 17".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No indication of overbank flooding from nearby stream observed.

Geomorphic Position:



Photo Name: Photo_180707134801



Photo Name: Photo_180707134852



Photo Name: Photo_180707134822

Additional Reference Data: Photos

HDR1076_18



Photo Name: Photo_180707134834



Photo Name: Photo_180707134843



Photo Name: Photo_180707134809

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/7/2018
 Applicant/Owner: PLP Sampling Point: HDR1077_18
 Investigators: ZH MD Landform (hillslope, terrace, etc.): Terrace
 Local Relief (concave, convex, none): None Slope(%): 5 HGM: N/A
 Subregion (LRR): X Lat: 59.899357 Long: -155.412964 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>6</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>6</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Vaccinium uliginosum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u>
2. <u>Salix pulchra</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Empetrum nigrum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>10</u> x2= <u>20</u>
4. <u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	FAC species <u>92</u> x3= <u>276</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>6</u> x4= <u>24</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>55</u>				Column Totals: <u>108</u> (A) <u>320</u> (B)
50% of total cover: <u>27.5</u>				<u>Prevalence Index = B/A=</u> <u>2.96</u>
20% of total cover: <u>11</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Viola langsdoeffii</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Rubus stellatus</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sanguisorba canadensis</u>	<u>4</u>	<u>No</u>	<u>FACW</u>	
7. <u>Rhodiola integrifolia</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Veratrum viride</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Achillea millefolium s.l.</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
10. <u>Rubus chamaemorus</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>53</u>				
50% of total cover: <u>26.5</u>				
20% of total cover: <u>10.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u>5</u> % Cover of Bryophytes <u>45</u>				
(Where applicable)				
Remarks: <u>Trace: Rho tom, Sal fus, Arc lat, Poa arc, Vah atr, Vac vit, Art arc, Cha ang, Pet fri, Tri eur, Ger eri, Pol acu, Dry exp, Aco del, Ang luc, Lyc ann, Ane nar, Lichen, Bare ground. North side of polygon has more herbs than south side but not enough to split polygon.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-17	7.5YR 2.5/1	60					No	Loamy Sand	hor:B/C *2
4-17	7.5YR 3/3	40					No	Loamy Sand	hor:B/C *3

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: WD - Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X

Remarks: *2: 2 matrix colors intermixed. Refusal on cobbles at 17". *3: 2 matrix colors intermixed. Refusal on cobbles at 17".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
(includes capillary fringe)	
	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No saturation to 17". No indication of overbank flooding from nearby stream.

Geomorphic Position:



Photo Name: Photo_180707145420



Photo Name: Photo_180707145400



Photo Name: Photo_180707145410



Photo Name: Photo_180707145327



Photo Name: Photo_180707145352



Photo Name: Photo_180707145335

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/7/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1078_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>4</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.899899</u>	Long: <u>-155.414139</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Subarctic Sedge – Moss Wet Meadow (SSMWM)</u>		NWI Classification: <u>PSS1/EM1B</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		

Remarks: Plot located in depressional area at toeslope. Seep located at west end of poly. Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>6</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>6</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Empetrum nigrum</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>28</u> x1= <u>28</u>
2. <u>Vaccinium uliginosum</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>40</u> x2= <u>80</u>
3. <u>Salix fuscescens</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	FAC species <u>66</u> x3= <u>198</u>
4. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u> </u> x4= <u> </u>
5. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>134</u> (A) <u>306</u> (B)
Total Cover: <u>45</u>				<u>Prevalence Index = B/A=</u> <u>2.28</u>
50% of total cover: <u>22.5</u>				
20% of total cover: <u>9</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Rubus chamaemorus</u>	<u>25</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Carex aquatilis</u>	<u>20</u>	<u>Yes</u>	<u>OBL</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Carex bigelowii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Carex pluriflora</u>	<u>5</u>	<u>No</u>	<u>OBL</u>	
7. <u>Sanguisorba canadensis</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Comarum palustre</u>	<u>3</u>	<u>No</u>	<u>OBL</u>	must be present, unless disturbed or problematic.
9. <u>Epilobium hornemannii</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
10. <u>Rhodiola integrifolia</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>89</u>				Hydrophytic
50% of total cover: <u>44.5</u>				Vegetation
20% of total cover: <u>17.8</u>				Yes <u>X</u> No <u> </u>
Plot size (radius, or length x width) <u>1/10 acre</u>				Present?
% Cover of Wetland Bryophytes <u>90</u>				
% Cover of Bryophytes <u>95</u>				
(Where applicable)				

Remarks:

Trace: Spi ste, Arc lat, Jun mer, Equ pal, Art arc, Ger eri, Ang luc, Pol acu, Car umb, Rum arc, Cor tri, Rub ste, Ped sud, Cor sue, Chr tet, Ste sit

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-19									hor:Oe

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: None		
Depth (inches):		
Field Drainage Class: VPD - Very Poorly Drained		

Remarks: Saturated organics.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 1.0		
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 6.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 4.0		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Water weeping in at 6" but not yet filled.

Geomorphic Position: Depressional area at toe of slope. Seasonal seep.



Photo Name: Photo_180707152159



Photo Name: Photo_180707153006



Photo Name: Photo_180707152207



Photo Name: Photo_180707152135



Photo Name: Photo_180707152218



Photo Name: Photo_180707152142



Photo Name: Photo_180707152151

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/8/2018
 Applicant/Owner: PLP Sampling Point: HDR1080_18
 Investigators: ZH MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Convex Slope(%): 8 HGM: N/A
 Subregion (LRR): X Lat: 59.900158 Long: -155.411667 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Willow Tall Shrub (OWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>67</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>55</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>13</u> x2= <u>26</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>98</u> x3= <u>294</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>25</u> x4= <u>100</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>136</u> (A) <u>420</u> (B)
Total Cover: <u>55</u>				<u>Prevalence Index = B/A=</u> <u>3.09</u>
50% of total cover: <u>27.5</u>				
20% of total cover: <u>11</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Gymnocarpium dryopteris</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	Morphological Adaptations ¹ (Provide
4. <u>Chamaenerion angustifolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Equisetum pratense</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Rubus stellatus</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
7. <u>Geranium erianthum</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Heracleum maximum</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	must be present, unless disturbed or problematic.
9. <u>Equisetum arvense</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u>Trientalis europaea</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>81</u>				
50% of total cover: <u>40.5</u>				
20% of total cover: <u>16.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes ⁵ <u> </u>				Vegetation
(Where applicable)				Yes <u>X</u> No <u> </u>
				Present?

Remarks:

Trace: Ang luc, Pyr asa, Ver vir, Aco del, Dry exp, Ane ric, Ado mos, Str amp.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-19	7.5YR 3/4	100					No	Fine Sandy Loam	hor:B/C 10% cobbles

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: WD - Well Drained					

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	No	X
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No saturation to 19". Profile dry throughout.

Geomorphic Position:



Photo Name: Photo_180707161012



Photo Name: Photo_180707160939



Photo Name: Photo_180707160949

Additional Reference Data: Photos

HDR1080_18



Photo Name: Photo_180707160956



Photo Name: Photo_180707161007



Photo Name: Photo_180707161002

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/8/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1081_18</u>	
Investigators: <u>ZH MSD</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>5</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.890526</u>	Long: <u>-155.412766</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
NW1 Classification: <u>U</u>		

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>1</u> x2= <u>2</u>
4. <u>Rhododendron tomentosum</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	FAC species <u>120</u> x3= <u>360</u>
5. <u>Spiraea stevenii</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	FACU species <u>1</u> x4= <u>4</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>102</u>				Column Totals: <u>122</u> (A) <u>366</u> (B)
50% of total cover: <u>51</u>				<u>Prevalence Index = B/A=</u> <u>3.00</u>
20% of total cover: <u>20.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex microchaeta</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Cornus suecica</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Rubus chamaemorus</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>20</u>				
50% of total cover: <u>10</u>				
20% of total cover: <u>4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u> </u>				Vegetation
% Cover of Wetland Bryophytes <u>3</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>40</u>				Present?
(Where applicable)				

Remarks: 8% Lichen. Trace: Vac vit, Ant mon, Sal fus, Bis plu, Ane nar, Ver vir, Equ arv, Art arc, Cla sar, Pyr asa, Lyc ann, Ped lab, Tri eur

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-3									hor:Oe
3-14	7.5YR 3/2	100					No	Silt Loam	hor:A/B Gravelly
14-19	10YR 4/3	100					No	Silt Loam	hor:B/C Gravelly

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: MWD - Moderately Well Drained					

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	No	X
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):					
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):					
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):					
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Face of pit wet from rain. No saturation and no water in pit.

Geomorphic Position: Gentle toeslope



Photo Name: Photo_180708083811



Photo Name: Photo_180708083708



Photo Name: Photo_180708083801



Photo Name: Photo_180708083659



Photo Name: Photo_180708083743



Photo Name: Photo_180708083752

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/8/2018</u>
Applicant/Owner: <u>PLP</u>		Sampling Point: <u>HDR1082_18</u>
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>2</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.890690</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS3/EM1B</u>	

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Carex (DEST-C)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Vaccinium uliginosum</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>3</u> x2= <u>6</u>
4. <u>Rhododendron tomentosum</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FAC species <u>150</u> x3= <u>450</u>
5. <u>Salix fuscescens</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	FACU species <u> </u> x4= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>103</u>				Column Totals: <u>153</u> (A) <u>456</u> (B)
50% of total cover: <u>51.5</u>				<u>Prevalence Index = B/A=</u> <u>2.98</u>
20% of total cover: <u>20.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Cornus suecica</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Rubus chamaemorus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>50</u>				
50% of total cover: <u>25</u>				
20% of total cover: <u>10</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u> </u>				
% Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-9									hor:Oe
9-14	10YR 2/2	100					N/A	Silt Loam	hor:A
14-19	10 YR 4/3	100					N/A	Silt Loam	hor:B/C Gravelly with few cobbles.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/>
Type: None					
Depth (inches):					
Field Drainage Class: PD - Poorly Drained					

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/>
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): 1.0				
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): 3.0				
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (includes capillary fringe)	Depth (inches): 2.0				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Surface water present in bottom of hummocks.

Geomorphic Position: Toeslope



Photo Name: Photo_180708091559



Photo Name: Photo_180708091628



Photo Name: Photo_180708091611



Photo Name: Photo_180708091619



Photo Name: Photo_180708091549



Photo Name: Photo_180708091637

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/8/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1083_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Floodplain</u>	
Local Relief (concave, convex, none): <u>Convex</u>	Slope(%): <u>2</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.891068</u>	Long: <u>-155.412964</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Closed Willow Low Shrub (CWLS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75</u> (A/B)
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
Sapling/Shrub Stratum				Prevalence Index worksheet: <u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u> OBL species <u> </u> x1= <u> </u> FACW species <u>7</u> x2= <u>14</u> FAC species <u>196</u> x3= <u>588</u> FACU species <u>40</u> x4= <u>160</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>243</u> (A) <u>762</u> (B) <i>Prevalence Index = B/A=</i> <u>3.14</u>
1. <u>Salix pulchra</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Salix barclayi</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>95</u>				
50% of total cover: <u>47.5</u>		20% of total cover: <u>19</u>		
Herb Stratum				Hydrophytic Vegetation Indicators: <u>X</u> Dominance Test is >50% <u> </u> Prevalence Index is ≤3.0 <u> </u> Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Adoxa moschatellina</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Gymnocarpium dryopteris</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	
4. <u>Equisetum sylvaticum</u>	<u>7</u>	<u>No</u>	<u>FAC</u>	
5. <u>Sanguisorba canadensis</u>	<u>7</u>	<u>No</u>	<u>FACW</u>	
6. <u>Carex podocarpa</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
7. <u>Veratrum viride</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
8. <u>Chamaenerion angustifolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
9. <u>Geranium erianthum</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
10. <u>Equisetum arvense</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>148</u>				
50% of total cover: <u>74</u>		20% of total cover: <u>29.6</u>		
Plot size (radius, or length x width) <u>1/10 acre</u>		% Bare Ground <u> </u>		
% Cover of Wetland Bryophytes <u> </u>		% Cover of Bryophytes <u> </u>		
(Where applicable)				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-6	10YR 3/2	100					No	Sandy Loam	hor:A
6-8	10YR 4/3	100					No	Very Fine Sandy	hor:B/C
8-13	10YR 3/2	15	7.5YR 4/4	20	C	M	No	Sandy Loam	hor:B/C
8-13	10YR 4/3	65					No	Sandy Loam	hor:B/C
13-19	10YR 3/4	90	7.5YR 3/4	10	C	M	No	Loamy Sand	hor:B/C Gravelly

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: <u>None</u> Depth (inches): _____ Field Drainage Class: <u>SPD - Somewhat Poorly Drained</u>	Hydric Soil Present? Yes _____ No _____ <u>X</u>
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Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes _____ No _____ <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No _____ <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No _____ <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____ <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Plot located near floodplain but plot is 4' higher than stream. No indications of flooding observed.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1083_18

	Absolute % Cover	Dominant Species?	Indicator Status
Herb			
Anemone richardsonii	3	No	FAC
Anjelica lucida	3	No	FACU
Rubus stellatus	2	No	FAC
Valeriana capitata	2	No	FAC
Athyrium cyclosorum	1	No	FAC
Rhodiola integrifolia	1	No	FAC
Viola epipsila	1	No	FAC
Achillea millefolium s.l.	1	No	FACU
Trientalis europaea	1	No	FACU

Additional Reference Data: Photos

HDR1083_18



Photo Name: Photo_180708101651



Photo Name: Photo_180708101626

Additional Reference Data: Photos

HDR1083_18



Photo Name: Photo_180708101645



Photo Name: Photo_180708101713



Photo Name: Photo_180708101638



Photo Name: Photo_180708101659

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/8/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1084_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Terrace</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>5</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.891235</u>	Long: <u>-155.413895</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Open Willow Low Shrub (OWLS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	
Hydric Soil Present? Yes <u> </u> No <u>X</u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		Yes <u> </u> No <u>X</u>
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>75</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix barclayi</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u>
2. <u>Empetrum nigrum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	FACW species <u>25</u> x2= <u>50</u>
4. <u>Salix pulchra</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FAC species <u>97</u> x3= <u>291</u>
5. <u>Veratrum viride</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FACU species <u>32</u> x4= <u>128</u>
6. <u>Vaccinium uliginosum</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>65</u>				Column Totals: <u>154</u> (A) <u>469</u> (B)
50% of total cover: <u>32.5</u>				<u>Prevalence Index = B/A=</u> <u>3.05</u>
20% of total cover: <u>13</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Chamaenerion angustifolium</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>	Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Geranium erianthum</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Viola langsdorffii</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
7. <u>Carex podocarpa</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Rubus stellatus</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Anemone richardsonii</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u>Rhodiola integrifolia</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>89</u>				
50% of total cover: <u>44.5</u>				
20% of total cover: <u>17.8</u>				
Plot size (radius, or length x width) <u>15 x 40 ft</u>				
% Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u>0</u>		% Cover of Bryophytes <u>10</u>		
(Where applicable)				
Remarks:				
Trace: Vac vit, Car big, Luz par, Poa sp., Car lac, Vah atr, Ang luc, Pyr min, Bis plu, Iri set, Lis cor, Art arc, Val cap, Str amp, Vio epi, Rum arc, Ane nar, Tri eur, Mic nel, Cha lat, Aco del.				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-4	7.5YR 3/2	100					No	Silt Loam	hor:A
4-5	10YR 3/3	100					No	Sandy Loam	hor:B
5-7	7.5YR 3/2	100					No	Silt Loam	hor:Ab
7-10	10YR 3/3	100					No	Sandy Loam	hor:B
10-11	7.5YR 3/2	100					No	Silt Loam	hor:Ab
11-19	7.5YR 3/2	90	7.5YR 4/4	10	C	M	No	Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type:			Yes	No	X
Depth (inches):	N/A				
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input type="checkbox"/> Surface Water (A1)			<input type="checkbox"/> Drainage Patterns (B10)		
<input type="checkbox"/> High Water Table (A2)			<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input checked="" type="checkbox"/> Saturation (A3)			<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Water Marks (B1)			<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Sediment Deposits (B2)			<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Drift Deposits (B3)			<input type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input type="checkbox"/> FAC-Neutral Test (D5)		
Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	No	X	Yes	No
Water Table Present?	Yes	X	No		
Saturation Present?	Yes	X	No		
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
3' higher than adjacent stream.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1084_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Achillea millefolium s.l.	1	No	FACU
Dryopteris expansa	1	No	FACU

Additional Reference Data: Photos

HDR1084_18



Photo Name: Photo_180708112940



Photo Name: Photo_180708112858

Additional Reference Data: Photos

HDR1084_18



Photo Name: Photo_180708112927



Photo Name: Photo_180708112848



Photo Name: Photo_180708112915



Photo Name: Photo_180708112949

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/8/2018</u>
Applicant/Owner: <u>PLP</u>		Sampling Point: <u>HDR1086_18</u>
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Valleybottom</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>2</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.891815</u>	Long: <u>-155.406342</u>
	Datum: <u>WGS84</u>	
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PEM1/SS1C</u>	

Vegetation Type: Subarctic Sedge – Moss Wet Meadow (SSMWM)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
	Total Cover: <u> </u>			Percent of Dominant Species
	50% of total cover: <u>0</u>	20% of total cover: <u>0</u>		That Are OBL, FACW, or FAC: <u>100</u> (A/B)
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u>85</u> <u>Multiply by:</u>
2. <u>Salix fuscescens</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>	OBL species <u>85</u> x1= <u>85</u>
3. <u>Betula nana</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACW species <u>29</u> x2= <u>58</u>
4. <u>Vaccinium uliginosum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FAC species <u>46</u> x3= <u>138</u>
5. <u>Andromeda polifolia</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	FACU species <u> </u> x4= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
	Total Cover: <u>66</u>			Column Totals: <u>160</u> (A) <u>281</u> (B)
	50% of total cover: <u>33</u>	20% of total cover: <u>13.2</u>		<u>Prevalence Index = B/A=</u> <u>1.76</u>
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex pluriflora</u>	<u>55</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex aquatilis</u>	<u>15</u>	<u>No</u>	<u>OBL</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Eriophorum angustifolium</u>	<u>10</u>	<u>No</u>	<u>OBL</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Rubus chamaemorus</u>	<u>8</u>	<u>No</u>	<u>FACW</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Comarum palustre</u>	<u>5</u>	<u>No</u>	<u>OBL</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Equisetum arvense</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
	Total Cover: <u>94</u>			
	50% of total cover: <u>47</u>	20% of total cover: <u>18.8</u>		
Plot size (radius, or length x width) <u>1/10 acre</u>		% Bare Ground <u> </u>		
% Cover of Wetland Bryophytes <u> </u>		% Cover of Bryophytes <u> </u>		
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-18									hor:Oe

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type:			Yes	<input checked="" type="checkbox"/> X	No
Depth (inches):	None				
Field Drainage Class:	VPD - Very Poorly Drained				

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Iron Deposits (B5)			<input checked="" type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input checked="" type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	1.0	
Water Table Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	2.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	1.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

1 " inundation in low areas. Hummocks present due to wetness. Stream channel with low banks (less than 6") adjacent to plot.

Geomorphic Position: Valley bottom.



Photo Name: Photo_180708131025



Photo Name: Photo_180708130855



Photo Name: Photo_180708130845

Additional Reference Data: Photos

HDR1086_18



Photo Name: Photo_180708130956



Photo Name: Photo_180708131014



Photo Name: Photo_180708131005

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/8/2018
 Applicant/Owner: PLP Sampling Point: HDR1087_18
 Investigators: ZH MD Landform (hillslope, terrace, etc.): Valleybottom
 Local Relief (concave, convex, none): Convex Slope(%): 5 HGM: N/A
 Subregion (LRR): X Lat: 59.891483 Long: -155.406250 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Mesic Herb (MH)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>75</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Salix barclayi</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>45</u> x2= <u>90</u>
3. <u>Empetrum nigrum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>55</u> x3= <u>165</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>57</u> x4= <u>228</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>157</u> (A) <u>483</u> (B)
Total Cover: <u>30</u>				<u>Prevalence Index = B/A=</u> <u>3.08</u>
50% of total cover: <u>15</u>				
20% of total cover: <u>6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Gymnocarpium dryopteris</u>	<u>40</u>	<u>Yes</u>	<u>FACU</u>	<u>X</u> Dominance Test is >50%
2. <u>Sanguisorba canadensis</u>	<u>35</u>	<u>Yes</u>	<u>FACW</u>	Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Chamaenerion angustifolium</u>	<u>15</u>	<u>No</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Viola langsdorffii</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Carex podocarpa</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
7. <u>Cornus suecica</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Geranium erianthum</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>127</u>				
50% of total cover: <u>63.5</u>				
20% of total cover: <u>25.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u>45</u>				
(Where applicable)				

Remarks: Trace: Spi ste, Vac uli, Luz par, Fes alt, Car lac, Rum ace, Equ syl, Aco del, Art arc, Dry exp, Vir ver, Equ arv, Pyr asa, Rho int, Poa arc, Luz mul, Vah atr, Dip alp, Ane nar, Fri cha, Ach mil, Ser ber, Iri set, Lyc ann, Sen tri, Str amp, Lup noo, Ang luc, Eri per, Tri eur, Rub ste, Lis cor, Ane ric.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-3	7.5YR 2.5/1	100					No	Sandy Loam	hor:A
3-18	7.5YR 3/2	90					No	Sandy Loam	hor:B/C Cobbles throughout.
3-18	7.5YR 2.5/1	10					No	Sandy Loam	hor:B/C Cobbles throughout.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: WD - Well Drained					

Remarks: Profile moist but not saturated. No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	No	X
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Plot approximately 3' higher in elevation than 1086.

Geomorphic Position:



Photo Name: Photo_180708135431



Photo Name: Photo_180708135405



Photo Name: Photo_180708135459



Photo Name: Photo_180708135419



Photo Name: Photo_180708135444



Photo Name: Photo_180708135355

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/8/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1088_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Valleybottom</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>4</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.891155</u>	Long: <u>-155.405640</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Open Willow Low Shrub (OWLS)</u>		NWI Classification: <u>PSS1/EM1C</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u>28</u> <u>Multiply by:</u>
2. <u>Vaccinium uliginosum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	OBL species <u>28</u> x1= <u>28</u>
3. <u>Salix fuscescens</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	FACW species <u>20</u> x2= <u>40</u>
4. <u>Empetrum nigrum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>66</u> x3= <u>198</u>
5. <u>Betula nana</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	FACU species <u>4</u> x4= <u>16</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>56</u>				Column Totals: <u>118</u> (A) <u>282</u> (B)
50% of total cover: <u>28</u>				<u>Prevalence Index = B/A=</u> <u>2.39</u>
20% of total cover: <u>11.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex pluriflora</u>	<u>20</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Rubus chamaemorus</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Carex aquatilis</u>	<u>5</u>	<u>Yes</u>	<u>OBL</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Sanguisorba canadensis</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Comarum palustre</u>	<u>3</u>	<u>No</u>	<u>OBL</u>	
7. <u>Anemone richardsonii</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Equisetum arvense</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Equisetum sylvaticum</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
10. <u>Rubus stellatus</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>62</u>				
50% of total cover: <u>31</u>				
20% of total cover: <u>12.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Cover of Wetland Bryophytes <u>60</u>				Vegetation
% Cover of Bryophytes <u>90</u>				Yes <u>X</u> No <u> </u>
(Where applicable)				Present?

Remarks: Trace: Pic gla, Spi ste, Bet x, Car big, Luz mul, Luz par, Eri per, Ver vir, Ang luc, Bis viv, Car pra, Ped sud, Art arc, Sen tri, Fri cam, Ped lan, Arn les, Pri pun, Pet fri, Pla dil, Lis cor, Aco del, Vio epi, Tri eur, Str amp, Pyr min, Rho int, Ang gen, Lichen.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-5									hor:Oi
5-18									hor:Oe

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			
Type:			
Depth (inches):	N/A		
Field Drainage Class:	VPD - Very Poorly Drained		
		Hydric Soil Present?	Yes <u> X </u> No <u> </u>

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)					
<input checked="" type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input checked="" type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input type="checkbox"/> Microtopographic Relief (D4)		
			<input checked="" type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations:					
Surface Water Present?	Yes	<input checked="" type="checkbox"/> No	Depth (inches):	1.0	
Water Table Present?	Yes	<input checked="" type="checkbox"/> No	Depth (inches):	3.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> No	Depth (inches):	2.0	
(includes capillary fringe)			Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

1" surface water in low areas and drainage patterns. Water weeping in at 3".

Geomorphic Position: Toeslope

Additional Reference Data: Overflow Vegetation

HDR1088_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Valeriana capitata	2	No	FAC
Geranium erianthum	2	No	FACU
Gymnocarpium dryopteris	2	No	FACU
Viola lanqsdorffii	2	No	FACW

Additional Reference Data: Photos

HDR1088_18



Photo Name: Photo_180708145716



Photo Name: Photo_180708145621

Additional Reference Data: Photos

HDR1088_18

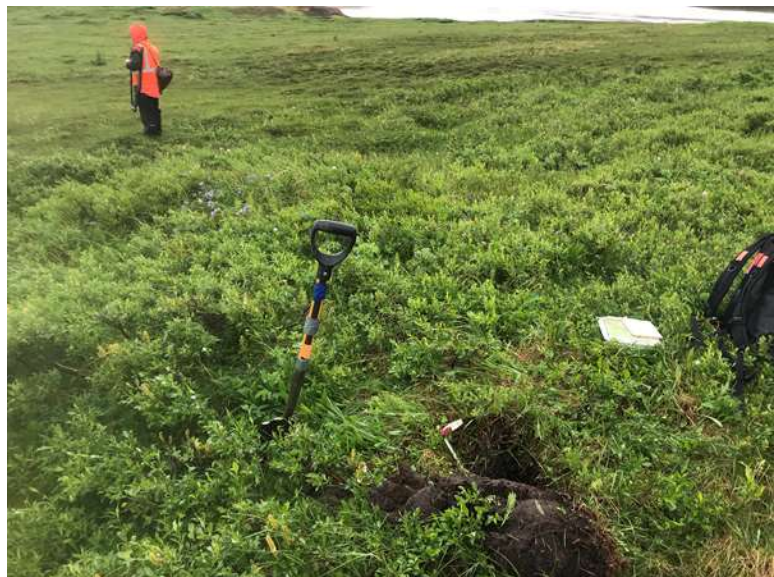


Photo Name: Photo_180708145706



Photo Name: Photo_180708145657



Photo Name: Photo_180708145626



Photo Name: Photo_180708145726

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/9/2018
 Applicant/Owner: PLP Sampling Point: HDR1091_18
 Investigators: ZH MD Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): Concave Slope(%): 8 HGM: Slope
 Subregion (LRR): X Lat: 59.888847 Long: -155.403137 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/EM1C

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				Prevalence Index worksheet: <u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u> OBL species <u>10</u> x1= <u>10</u> FACW species <u>12</u> x2= <u>24</u> FAC species <u>72</u> x3= <u>216</u> FACU species <u>10</u> x4= <u>40</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>104</u> (A) <u>290</u> (B)
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
Sapling/Shrub Stratum				
1. <u>Salix pulchra</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: X Dominance Test is >50% X Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Spiraea stevenii</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	
3. <u>Empetrum nigrum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>55</u>				Hydrophytic Vegetation Indicators: X Dominance Test is >50% X Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
50% of total cover: <u>27.5</u>		20% of total cover: <u>11</u>		
Herb Stratum				
1. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: X Dominance Test is >50% X Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	
3. <u>Equisetum arvense</u>	<u>8</u>	<u>Yes</u>	<u>FAC</u>	
4. <u>Carex bigelowii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
5. <u>Carex pluriflora</u>	<u>5</u>	<u>No</u>	<u>OBL</u>	
6. <u>Comarum palustre</u>	<u>5</u>	<u>No</u>	<u>OBL</u>	
7. <u>Anemone richardsonii</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
8. <u>Rubus stellatus</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
9. <u>Viola langsdorffii</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Hydrophytic Vegetation Indicators: X Dominance Test is >50% X Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
Total Cover: <u>49</u>				
50% of total cover: <u>24.5</u>		20% of total cover: <u>9.8</u>		
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u> % Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u> (Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-8									hor:Oe
8-19	10YR 3/2	100					N/A	Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: None		
Depth (inches):		
Field Drainage Class: PD - Poorly Drained		

Remarks: H2S at 9".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 1.0		
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 6.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 4.0		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Water weeping in at 6". 1" inundation in low areas and drainage patterns.

Geomorphic Position: Toeslope



Photo Name: Photo_180708162540



Photo Name: Photo_180708162518



Photo Name: Photo_180708162526



Photo Name: Photo_180708162448



Photo Name: Photo_180708162500



Photo Name: Photo_180708162438

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/9/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1092_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>0</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.920441</u>	Long: <u>-155.402649</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Closed Willow Low Shrub (CWLS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>67</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Salix alaxensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>18</u> x2= <u>36</u>
3. <u>Alnus sinuata</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	FAC species <u>119</u> x3= <u>357</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>51</u> x4= <u>204</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>188</u> (A) <u>597</u> (B)
Total Cover: <u>86</u>				<u>Prevalence Index = B/A=</u> <u>3.18</u>
50% of total cover: <u>43</u>				
20% of total cover: <u>17.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Gymnocarpium dryopteris</u>	<u>40</u>	<u>Yes</u>	<u>FACU</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>8</u>	<u>No</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Rubus stellatus</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Geranium erianthum</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
7. <u>Equisetum pratense</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Viola langsdoeffii</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	must be present, unless disturbed or problematic.
9. <u>Anemone richardsonii</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
10. <u>Chamaenerion angustifolium</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>102</u>				
50% of total cover: <u>51</u>				
20% of total cover: <u>20.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u> </u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>15</u>				Present?
(Where applicable)				

Remarks: Trace: Sal bar, Poa sp., Fes alt, Aco del, Ang luc, Rho int, Gal bor, Ach mil, Pet fri, Moe lat, Cer ber, Ped sud, Ste sit. Lichen

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-5	7.5YR 3/2	100					N/A	Fine Sandy Loam	hor:B
5-7	10YR 2/2	100					N/A	Silt Loam	hor:Ab
7-10	7.5YR 3/2	100					N/A	Fine Sandy Loam	hor:B
10-11	7.5YR 3/1	100					N/A	Silt Loam	hor:Ab
11-15	7.5YR 3/4	100					N/A	Sandy Loam	hor:B
15-18	7.5YR 3/4	100					N/A	Loamy Sand	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: WD - Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X

Remarks: Profile moist but not saturated. No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
(includes capillary fringe)	
	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No indication of recent flooding from nearby stream. Plot located approximately 5 feet higher in elevation than nearby stream.

Geomorphic Position: Toeslope

Additional Reference Data: Overflow Vegetation

HDR1092_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Pyrola asarifolia	2	No	FACU
Valeriana capitata	1	No	FAC
Mertensia paniculata	1	No	FACU
Trientalis europaea	1	No	FACU

Additional Reference Data: Photos

HDR1092_18



Photo Name: Photo_180709144215



Photo Name: Photo_180709144255



Photo Name: Photo_180709144251



Photo Name: Photo_180709144311



Photo Name: Photo_180709144259



Photo Name: Photo_180709144206

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/10/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1094_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Swale</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>12</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.923637</u>	Long: <u>-155.403091</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Closed Willow Low Shrub (CWLS)</u>		NWI Classification: <u>PSS1B</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>75</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>65</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Salix barclayi</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>40</u> x2= <u>80</u>
3. <u>Spiraea stevenii</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	FAC species <u>103</u> x3= <u>309</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>19</u> x4= <u>76</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>162</u> (A) <u>465</u> (B)
Total Cover: <u>87</u>				<u>Prevalence Index = B/A=</u> <u>2.87</u>
50% of total cover: <u>43.5</u>				
20% of total cover: <u>17.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Sanguisorba canadensis</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Dominance Test is >50%
2. <u>Gymnocarpium dryopteris</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Rubus stellatus</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Chamaenerion angustifolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Equisetum pratense</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Viola langsdorffii</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
8. <u>Anemone richardsonii</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
9. <u>Calamagrostis canadensis</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
10. <u>Cornus suecica</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>75</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>37.5</u>				
20% of total cover: <u>15</u>				
Plot size (radius, or length x width) <u>20 x 45 ft</u>				
% Cover of Wetland Bryophytes <u>15</u>				
% Cover of Bryophytes <u>25</u>				
(Where applicable)				

Remarks: Trace: Vac vit, Poa alpigena, Car pod, Str amp, Com pal, Dry exp, Aco del, Fri cam, Rho int, Lyc ann, Ort sec, Pyr min, Pyr asa, lichen.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-17							No		hor:Oe

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> No
Type: None				
Depth (inches):				
Field Drainage Class: VPD - Very Poorly Drained				

Remarks: Cobbles mixed with organics starting at 8".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> No
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):			
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	3.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	1.0		
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position: Swale

Additional Reference Data: Overflow Vegetation

HDR1094_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Iris setosa	1	No	FAC
Geranium erianthum	1	No	FACU
Trientalis europaea	1	No	FACU

Additional Reference Data: Photos

HDR1094_18



Photo Name: Photo_180709160843



Photo Name: Photo_180709160906

Additional Reference Data: Photos

HDR1094_18



Photo Name: Photo_180709160833



Photo Name: Photo_180709160854



Photo Name: Photo_180709160859



Photo Name: Photo_180709160827

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/10/2018
 Applicant/Owner: PLP Sampling Point: HDR1096_18
 Investigators: ZH MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 15 HGM: N/A
 Subregion (LRR): X Lat: 59.897312 Long: -155.365753 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Salix reticulata</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium uliginosum</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACW species <u>5</u> x2= <u>10</u>
4. <u>Betula nana</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FAC species <u>142</u> x3= <u>426</u>
5. <u>Salix pulchra</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	FACU species <u>5</u> x4= <u>20</u>
6. <u>Dryas octopetala</u>	<u>2</u>	<u>No</u>	<u>NL</u>	UPL species <u>7</u> x5= <u>35</u>
Total Cover: <u>80</u>				Column Totals: <u>159</u> (A) <u>491</u> (B)
50% of total cover: <u>40</u>				Prevalence Index = B/A= <u>3.09</u>
20% of total cover: <u>16</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Anemone parviflora</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Arctagrostis latifolia</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
5. <u>Arnica lessingii</u>	<u>5</u>	<u>No</u>	<u>NL</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Valeriana capitata</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
7. <u>Carex podocarpa</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Festuca altaica</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>79</u>				
50% of total cover: <u>39.5</u>				
20% of total cover: <u>15.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic Vegetation Present?
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				Yes <u>X</u> No <u> </u>
(Where applicable)				
Remarks: <u>Trace: Rho tom, Vac vit, Poa arc, Cal can, Car lac, Ane ric, Ane nar, Rho int, Aco del, Car pra, Ped lan, Sen res, Ang luc, Art arc, Bis plu, Ste lon, Cla sar, Mic hie, Pyr min, Ser ber, Lag gla, Dry exp, Luz mul, Lichen.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-5									hor:Oe
5-13	7.5YR 3/1	85	5YR3/4	15	C	M RC	No	Silt Loam	hor:B
13-19	7.5YR 3/1	100					No	Silt Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: SPD - Somewhat Poorly Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):	
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 8.0	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 6.0	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Water weeping in pit at 8". Heavy recent rains.

Geomorphic Position: Concave area on hillslope.



Photo Name: Photo_180710085855



Photo Name: Photo_180710085905



Photo Name: Photo_180710085928

Additional Reference Data: Photos

HDR1096_18



Photo Name: Photo_180710085919



Photo Name: Photo_180710085912



Photo Name: Photo_180710085842

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/10/2018
 Applicant/Owner: PLP Sampling Point: HDR1098_18
 Investigators: ZH MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 10 HGM: Slope
 Subregion (LRR): X Lat: 59.897133 Long: -155.366745 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/EM1B

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
Tree Stratum				Number of Dominant Species
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>2</u> (B)
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Percent of Dominant Species
Total Cover: <u> </u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		Prevalence Index worksheet:
Sapling/Shrub Stratum				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>65</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>5</u> x1= <u>5</u>
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>7</u> x2= <u>14</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>119</u> x3= <u>357</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u> </u> x4= <u> </u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>131</u> (A) <u>376</u> (B)
Total Cover: <u>65</u>				<u>Prevalence Index = B/A=</u> <u>2.87</u>
50% of total cover: <u>32.5</u>		20% of total cover: <u>13</u>		Hydrophytic Vegetation Indicators:
Herb Stratum				<u>X</u> Dominance Test is >50%
1. <u>Calamagrostis canadensis</u>	<u>45</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
2. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
3. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
4. <u>Comarum palustre</u>	<u>5</u>	<u>No</u>	<u>OBL</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
5. <u>Anemone richardsonii</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
6. <u>Carex bigelowii</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
7. <u>Petasites frigidus s.l.</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>66</u>				
50% of total cover: <u>33</u>		20% of total cover: <u>13.2</u>		
Plot size (radius, or length x width) <u>15 x 35 ft</u>		% Bare Ground <u> </u>		Hydrophytic
% Cover of Wetland Bryophytes <u> </u>		% Cover of Bryophytes <u>30</u>		Vegetation
(Where applicable)				Yes <u>X</u> No <u> </u>
				Present?

Remarks:
 Trace: Spi ste, Sal ret, Vac uli, Poa arc, Fes alt, Com Ang, Equ var, Car pra, Aco del, Rho int, Ang luc, Bis viv, Mic nel, Dry exp, Rum arc, Mic hei, Lichen, water.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-17									hor:Oe

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type:	None		Yes	<input checked="" type="checkbox"/> X	No
Depth (inches):					
Field Drainage Class:	VPD - Very Poorly Drained				

Remarks: H2S at 5". Organics mixed with cobbles starting at 4".

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Water Marks (B1)		<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input checked="" type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	1.0	
Water Table Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	1.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	0.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
1" surface water in low areas.

Geomorphic Position: Seep located upslope.



Photo Name: Photo_180710101621



Photo Name: Photo_180710101627



Photo Name: Photo_180710101605



Photo Name: Photo_180710101644



Photo Name: Photo_180710101611



Photo Name: Photo_180710101639

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/10/2018
 Applicant/Owner: PLP Sampling Point: HDR1100_18
 Investigators: ZH MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Convex Slope(%): 12 HGM: N/A
 Subregion (LRR): X Lat: 59.897270 Long: -155.366913 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B)
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Prevalence Index worksheet: <u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u> OBL species <u> </u> x1= <u> </u> FACW species <u> </u> x2= <u> </u> FAC species <u>96</u> x3= <u>288</u> FACU species <u> </u> x4= <u> </u> UPL species <u>25</u> x5= <u>125</u> Column Totals: <u>121</u> (A) <u>413</u> (B) <i>Prevalence Index = B/A=</i> <u>3.41</u>
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				
50% of total cover: <u>0</u>			20% of total cover: <u>0</u>	
<u>Sapling/Shrub Stratum</u>				
1. <u>Empetrum nigrum</u>	25	Yes	FAC	Hydrophytic Vegetation Indicators: X Dominance Test is >50% Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Salix reticulata</u>	20	Yes	FAC	
3. <u>Dryas octopetala</u>	15	Yes	NL	
4. <u>Vaccinium uliginosum</u>	5	No	FAC	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>65</u>				
50% of total cover: <u>32.5</u>			20% of total cover: <u>13</u>	
<u>Herb Stratum</u>				
1. <u>Poa arctica</u>	25	Yes	FAC	Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
2. <u>Carex microchaeta</u>	15	Yes	FAC	
3. <u>Hierochloe alpina</u>	5	No	NL	
4. <u>Arnica lessingii</u>	4	No	NL	
5. <u>Valeriana capitata</u>	3	No	FAC	
6. <u>Festuca altaica</u>	2	No	FAC	
7. <u>Stellaria longipes</u>	1	No	FAC	
8. <u>Campanula lasiocarpa</u>	1	No	UPL	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>56</u>				
50% of total cover: <u>28</u>			20% of total cover: <u>11.2</u>	
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes ⁸⁵ <u> </u>				
(Where applicable)				

Remarks:

Trace: Rho tom, Bet nan, Art arc, Cha ang, Ang luc, Ane nar, Rho int, Sen res, Cla sar, Bis plu, Min arc, Lichen

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-4									hor:Oe
4-14	10YR 4/2	90	7.5YR 3/4	10	C	PL M	N/A	Sandy Loam	hor:B
14-19	7.5YR 3/4	100					N/A	Loamy Sand	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: None Depth (inches): Field Drainage Class: WD - Well Drained	Hydric Soil Present? Yes No X
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Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes No X Depth (inches): Water Table Present? Yes No X Depth (inches): Saturation Present? Yes No X Depth (inches): (includes capillary fringe)	Wetland Hydrology Present? Yes No X
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No saturation to 19 inches.

Geomorphic Position:



Photo Name: Photo_180710113818



Photo Name: Photo_180710113847



Photo Name: Photo_180710113839



Photo Name: Photo_180710113829



Photo Name: Photo_180710113738



Photo Name: Photo_180710113728

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/10/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1102_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Swale</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>15</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.897682</u>	Long: <u>-155.368179</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Mesic Herb (MH)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>			20% of total cover: <u>0</u>	That Are OBL, FACW, or FAC: <u>100</u> (A/B)
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Harrimanella stelleriana</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix reticulata</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FACW species <u>45</u> x2= <u>90</u>
4. <u>Salix pulchra</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	FAC species <u>118</u> x3= <u>354</u>
5. <u>Spiraea stevenii</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	FACU species <u>3</u> x4= <u>12</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u>20</u> x5= <u>100</u>
Total Cover: <u>34</u>				Column Totals: <u>186</u> (A) <u>556</u> (B)
50% of total cover: <u>17</u>			20% of total cover: <u>6.8</u>	<u>Prevalence Index = B/A=</u> <u>2.99</u>
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Sanguisorba canadensis</u>	<u>35</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Anemone richardsonii</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Luetkea pectinata</u>	<u>15</u>	<u>No</u>	<u>UPL</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Rubus stellatus</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Viola epipsila</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Carex podocarpa</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
8. <u>Arnica lessingii</u>	<u>5</u>	<u>No</u>	<u>NL</u>	
9. <u>Rhodiola integrifolia</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
10. <u>Veratrum viride</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>152</u>				Hydrophytic
50% of total cover: <u>76</u>			20% of total cover: <u>30.4</u>	Vegetation
Plot size (radius, or length x width) <u>10 x 40 ft</u>			% Bare Ground <u> </u>	Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u>0</u>	% Cover of Bryophytes <u>20</u>			Present?
(Where applicable)				
Remarks:				
<u>Trace: Car micropoda, Pri qun, Run esc, Ang luc, Pol acu, Pyr min, Dry exp, Ath fel, Mic nel, Art arc, Gen gla.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-3	10YR 3/4	100					N/A	Sandy Loam	hor:B
3-5	10YR 2/2	100					N/A	Silt Loam	hor:B
5-19	10YR 3/3	100					N/A	Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: WD - Well Drained					

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):			
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):			
Saturation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):			
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No saturation to 19". No indication of surface flows in swale. Two secondary hydrology indicators present.

Geomorphic Position: Swale

Additional Reference Data: Overflow Vegetation

HDR1102_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Trientalis europaea	2	No	FACU

Additional Reference Data: Photos

HDR1102_18



Photo Name: Photo_180710123123



Photo Name: Photo_180710123212



Photo Name: Photo_180710123143



Photo Name: Photo_180710123153



Photo Name: Photo_180710123109



Photo Name: Photo_180710123132

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/10/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1105_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>23</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.898594</u>	Long: <u>-155.370972</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
NW1 Classification: <u>PEM1C</u>		

Vegetation Type: Subarctic Sedge – Moss Wet Meadow (SSMWM)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If No, explain in Remarks)

Are Vegetation: ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation: ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				
1. _____	_____	_____	_____	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>100</u> x1= <u>100</u> FACW species <u>14</u> x2= <u>28</u> FAC species <u>41</u> x3= <u>123</u> FACU species _____ x4= _____ UPL species _____ x5= _____ Column Totals: <u>155</u> (A) <u>251</u> (B) <i>Prevalence Index = B/A=</i> <u>1.62</u>
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
Sapling/Shrub Stratum				
1. <u>Salix pulchra</u>	<u>8</u>	Yes	FAC	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Salix fuscescens</u>	<u>4</u>	Yes	FACW	
3. <u>Empetrum nigrum</u>	<u>2</u>	No	FAC	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
Total Cover: <u>14</u>				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
50% of total cover: <u>7</u>		20% of total cover: <u>2.8</u>		
Herb Stratum				
1. <u>Carex pluriflora</u>	<u>40</u>	Yes	OBL	Hydrophytic Vegetation Present?
2. <u>Comarum palustre</u>	<u>30</u>	Yes	OBL	
3. <u>Eriophorum angustifolium</u>	<u>25</u>	Yes	OBL	
4. <u>Equisetum arvense</u>	<u>20</u>	No	FAC	
5. <u>Sanguisorba canadensis</u>	<u>10</u>	No	FACW	
6. <u>Calamagrostis canadensis</u>	<u>5</u>	No	FAC	
7. <u>Rubus stellatus</u>	<u>5</u>	No	FAC	
8. <u>Carex aquatilis</u>	<u>5</u>	No	OBL	
9. <u>Viola epipsila</u>	<u>1</u>	No	FAC	
10. _____	_____	_____	_____	
Total Cover: <u>141</u>				
50% of total cover: <u>70.5</u>		20% of total cover: <u>28.2</u>		
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground _____ % Cover of Wetland Bryophytes <u>65</u> % Cover of Bryophytes <u>80</u> (Where applicable)				

Remarks:

Trace: Har ste, Spi ste, Car lac, Jun mer, Car big, Car micropoda, Phl alp, Ger eri, Rum arc, Lue pec, Ath fel, Pyr asa, Ver wor, Ver vir, Rho int, Ran esch, Dry exp, Pyr min, Pri cun, Cor sue, Pri pum, Tri eur, Vio lan, Mic nel, Card umb, Epi hor, Lis cor, lichen, water.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-17									hor:Oe
17-21	10YR 2/2	100					N/A	Sandy Loam	hor:B/C Gravelly

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: <u>None</u> Depth (inches): _____ Field Drainage Class: <u>PD - Poorly Drained</u>	Hydric Soil Present? Yes <u>X</u> No _____
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Remarks: H2S at 6".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>1.0</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>3.0</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0.0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position: Side slope seep.



Photo Name: Photo_180710145126



Photo Name: Photo_180710145138



Photo Name: Photo_180710145113

Additional Reference Data: Photos

HDR1105_18



Photo Name: Photo_180710145151



Photo Name: Photo_180710145055



Photo Name: Photo_180710145101

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	7/10/2018
Applicant/Owner:	PLP			Sampling Point:	HDR1106_18
Investigators:	ZH MD	Landform (hillslope, terrace, etc.):	Terrace		
Local Relief (concave, convex, none):	None	Slope(%):	15	HGM:	N/A
Subregion (LRR):	X	Lat:	59.899200	Long:	-155.368088
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	U		

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

Hydrophytic Vegetation Present?	Yes <u> </u>	No <u>X</u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u> </u> X
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>			

Tree Stratum		Absolute % Cover	Dominant Species?	Indicator Status
1.				
2.				
3.				
4.				
Total Cover:				
50% of total cover:		0	20% of total cover:	0
Sapling/Shrub Stratum				
1.	Spiraea stevenii	10	Yes	FACU
2.				
3.				
4.				
5.				
6.				
Total Cover:		10		
50% of total cover:		5	20% of total cover:	2
Herb Stratum				
1.	Calamagrostis canadensis	80	Yes	FAC
2.	Dryopteris expansa	10	No	FACU
3.	Equisetum arvense	8	No	FAC
4.	Viola langsdorffii	7	No	FACW
5.	Rubus stellatus	5	No	FAC
6.	Chamaenerion angustifolium	5	No	FACU
7.	Sanguisorba canadensis	5	No	FACW
8.	Carex podocarpa	3	No	FAC
9.	Veratrum viride	3	No	FAC
10.	Trientalis europaea	1	No	FACU
Total Cover:		127		
50% of total cover:		63.5	20% of total cover:	25.4
Plot size (radius, or length x width) 1/10 acre		% Bare Ground		
% Cover of Wetland Bryophytes		% Cover of Bryophytes ⁵		
(Where applicable)				

Dominance Test Worksheet:

Number of Dominant Species _____

That Are OBL, FACW, or FAC: _____ 1 (A)

Total Number of Dominant Species Across All Strata: _____ 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ 50 (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x1= _____

FACW species _____ 12 x2= _____ 24

FAC species _____ 99 x3= _____ 297

FACU species _____ 26 x4= _____ 104

UPL species _____ x5= _____

Column Totals: _____ 137 (A) _____ 425 (B)

Prevalence Index = B/A= _____ 3.10

Hydrophytic Vegetation Indicators:

_____ Dominance Test is >50%

_____ Prevalence Index is ≤3.0

_____ Morphological Adaptations¹ (Provide data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present?

Yes _____ No _____ X _____

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Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-6									hor:Oi
6-14	10YR 3/3	10	7.5YR 4/4	15	C	M	N/A	Sandy Loam	hor:A/B
6-14	7.5YR 3/3	75					N/A	Sandy Loam	hor:A/B
14-18	7.5YR 2.5/3	90	7.5YR 4/4	10	C	M	N/A	Loamy Sand	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present): Type: <u>None</u> Depth (inches): _____ Field Drainage Class: <u>MWD - Moderately Well Drained</u>	Hydric Soil Present? Yes _____ No _____ <u>X</u>
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Remarks: Cobbles throughout. No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No _____ <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No _____ <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No _____ <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____ <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Adjacent to stream but no indications of overbank flooding observed..

Geomorphic Position:



Photo Name: Photo_180710160145



Photo Name: Photo_180710160124



Photo Name: Photo_180710160201



Photo Name: Photo_180710160135



Photo Name: Photo_180710160151



Photo Name: Photo_180710160111

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/11/2018</u>
Applicant/Owner: <u>PLP</u>		Sampling Point: <u>HDR1108_18</u>
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>5</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.907734</u>	Long: <u>-155.359879</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1/EM1B</u>	Datum: <u>WGS84</u>

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Salix pulchra</u>	<u>55</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>60</u>				
50% of total cover: <u>30</u>		20% of total cover: <u>12</u>		

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Calamagrostis canadensis</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Comarum palustre</u>	<u>25</u>	<u>Yes</u>	<u>OBL</u>	
3. <u>Equisetum arvense</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	
4. <u>Sanguisorba canadensis</u>	<u>15</u>	<u>No</u>	<u>FACW</u>	
5. <u>Equisetum sylvaticum</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	
6. <u>Carex utriculata</u>	<u>5</u>	<u>No</u>	<u>OBL</u>	
7. <u>Polemonium acutiflorum</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
8. <u>Rubus stellatus</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
9. <u>Rubus chamaemorus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
10. <u>Anemone richardsonii</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>149</u>				
50% of total cover: <u>74.5</u>		20% of total cover: <u>29.8</u>		
Plot size (radius, or length x width) <u>1/10 acre</u>		% Bare Ground <u> </u>		
% Cover of Wetland Bryophytes <u> </u>		% Cover of Bryophytes <u> </u>		
(Where applicable)				

Dominance Test Worksheet:

Number of Dominant Species

That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>31</u>	x1= <u>31</u>
FACW species <u>19</u>	x2= <u>38</u>
FAC species <u>159</u>	x3= <u>477</u>
FACU species <u> </u>	x4= <u> </u>
UPL species <u> </u>	x5= <u> </u>
Column Totals: <u>209</u> (A)	<u>546</u> (B)

Prevalence Index = B/A= 2.61

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0

Morphological Adaptations¹ (Provide data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-5									hor:Oi
5-13									hor:Oe
13-19	2.5Y 4/2	80	7.5YR 2.5/3	20	C	M RC	No	Silt Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		
Type: None		
Depth (inches):		
Field Drainage Class: PD - Poorly Drained		
	Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks: Cobbles mixed with organics from 10" to 13".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 2.0		
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 2.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0 (includes capillary fringe)		
	Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
2" surface water in micro lows.

Geomorphic Position: Toeslope

Additional Reference Data: Overflow Vegetation

HDR1108_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Viola epipsila	1	No	FAC
Petasites frigidus s.l.	1	No	FACW
Viola lanqsdorffii	1	No	FACW
Eriophorum angustifolium	1	No	OBL

Additional Reference Data: Photos

HDR1108_18



Photo Name: Photo_180711084053



Photo Name: Photo_180711084038

Additional Reference Data: Photos

HDR1108_18



Photo Name: Photo_180711084140



Photo Name: Photo_180711084204



Photo Name: Photo_180711084124



Photo Name: Photo_180711084110

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/11/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1109_18</u>	
Investigators: <u>ZH MSD</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>Convex</u>	Slope(%): <u>10</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.907112</u>	Long: <u>-155.360580</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
NW1 Classification: <u>U</u>		

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If No, explain in Remarks)

Are Vegetation: ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation: ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>6</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>6</u> (B)
4. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
Total Cover: _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u> </u> x1= _____ FACW species <u>6</u> x2= <u>12</u> FAC species <u>111</u> x3= <u>333</u> FACU species <u>13</u> x4= <u>52</u> UPL species <u> </u> x5= _____ Column Totals: <u>130</u> (A) <u>397</u> (B)
50% of total cover: <u>0</u>				
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index = B/A = <u>3.05</u>
1. <u>Empetrum nigrum</u>	<u>45</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: X Dominance Test is >50% Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Salix pulchra</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
3. <u>Salix reticulata</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
4. <u>Vaccinium uliginosum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
5. <u>Spiraea stevenii</u>	<u>8</u>	<u>No</u>	<u>FACU</u>	
6. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>88</u>				
50% of total cover: <u>44</u>				
20% of total cover: <u>17.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground _____				
Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. <u>Festuca altaica</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Cornus suecica</u>	<u>8</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
4. <u>Equisetum arvense</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
5. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>	
6. <u>Anemone narcissiflora</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
7. <u>Carex microchaeta</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
8. <u>Chamaenerion angustifolium</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
9. <u>Carex podocarpa</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u>Viola langsdoerffii</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>42</u>				
50% of total cover: <u>21</u>				
20% of total cover: <u>8.4</u>				
% Cover of Wetland Bryophytes <u>0</u> (Where applicable) % Cover of Bryophytes <u>20</u>				
Remarks: <u>Trace: Vac vit, Sal bar, Car spe, Poa arc, Luz mul, Luz par, Ste lon, Arn les, Sol mul, San lug, Ang luc, Lup noo, Str amp, Equ syl, Cla sar, Gal bor, Bis plu, Art arc, Aco del, Eri per, Ach mil, Val cap, Pol acu, Tri eur, Ane ric, Pyr min, Bis viv, Rho int, Pyr asa, Rub ste, Dry exp, Ped ver, Lichen.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-6									hor:Oe
6-16	7.5YR 2.5/1	100					No	Sandy Loam	hor:A/B Gravelly
16-20	7.5YR 3/2	100					No	Loamy Coarse	hor:B/C Cemented

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: <u>Compacted layer at 16"</u> Depth (inches): <u>16</u> Field Drainage Class: <u>MWD - Moderately Well Drained</u>	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>
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Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <u> </u> Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u> 14.0 </u> Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u> 11.0 </u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Heavy rains recently. Compacted soils at 16".

Geomorphic Position:

Additional Reference Data: Photos

HDR1109_18



Photo Name: Photo_180711095424



Photo Name: Photo_180711095437



Photo Name: Photo_180711095340



Photo Name: Photo_180711095353



Photo Name: Photo_180711095408



Photo Name: Photo_180711095331

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/11/2018
 Applicant/Owner: PLP Sampling Point: HDR1110_18
 Investigators: ZH MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 18 HGM: N/A
 Subregion (LRR): X Lat: 59.906780 Long: -155.360443 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Closed Willow Tall Shrub (CWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>85</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>40</u> x2= <u>80</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>160</u> x3= <u>480</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>11</u> x4= <u>44</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>85</u>				Column Totals: <u>211</u> (A) <u>604</u> (B)
50% of total cover: <u>42.5</u>				Prevalence Index = B/A= <u>2.86</u>
20% of total cover: <u>17</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Sanguisorba canadensis</u>	<u>35</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Anemone richardsonii</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Chamaenerion angustifolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Viola langsdorffii</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
7. <u>Valeriana capitata</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Geranium erianthum</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	must be present, unless disturbed or problematic.
9. <u>Rhodiola integrifolia</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
10. <u>Rubus stellatus</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>126</u>				
50% of total cover: <u>63</u>				
20% of total cover: <u>25.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u>5</u> % Cover of Bryophytes <u>30</u>				
(Where applicable)				

Remarks:
 Trace: Luz par, Car big, Car umb, Ang luc, Equ syl, Pol acu, Ach mil, Str amp, Aco del, Dry exp, Cor sue, Ste sit, Pet fri, Pyr min, Lichen.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-5									hor:Oe
5-18	5YR 3/1	100					No	Coarse Sandy	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			
Type: None			
Depth (inches):			
Field Drainage Class: MWD - Moderately Well Drained			
		Hydric Soil Present?	Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 2.0		
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 8.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0 (includes capillary fringe)		
	Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Episaturation from 0-6". Soil below 6" is moist but not saturated. Water weeping into pit from 6 inches and filling pit from top down. Surface water located in nearby small depression.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1110_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Trientalis europaea	2	No	FACU
Pyrola asarifolia	1	No	FACU

Additional Reference Data: Photos

HDR1110_18



Photo Name: Photo_180711105222



Photo Name: Photo_180711105251

Additional Reference Data: Photos

HDR1110_18



Photo Name: Photo_180711105242



Photo Name: Photo_180711105205



Photo Name: Photo_180711105214

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/11/2018
 Applicant/Owner: PLP Sampling Point: HDR1112_18
 Investigators: ZH MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 12 HGM: Slope
 Subregion (LRR): X Lat: 59.906387 Long: -155.362122 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/EM1B

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
Total Cover:	<u> </u>				
50% of total cover:	<u>0</u>	20% of total cover:	<u>0</u>		
Sapling/Shrub Stratum				Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: <u> </u> OBL species <u>22</u> x1= <u>22</u> FACW species <u> </u> x2= <u> </u> FAC species <u>168</u> x3= <u>504</u> FACU species <u> </u> x4= <u> </u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>190</u> (A) <u>526</u> (B) <i>Prevalence Index = B/A=</i> <u>2.77</u>	
1. <u>Salix pulchra</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>		
2. <u>Salix barclayi</u>	<u>10</u>	<u>No</u>	<u>FAC</u>		
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
Total Cover:	<u>60</u>				
50% of total cover:	<u>30</u>	20% of total cover:	<u>12</u>		
Herb Stratum				Hydrophytic Vegetation Indicators: X Dominance Test is >50% X Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	
1. <u>Equisetum arvense</u>	<u>55</u>	<u>Yes</u>	<u>FAC</u>		
2. <u>Calamagrostis canadensis</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>		
3. <u>Comarum palustre</u>	<u>20</u>	<u>No</u>	<u>OBL</u>		
4. <u>Anemone richardsonii</u>	<u>3</u>	<u>No</u>	<u>FAC</u>		
5. <u>Carex pluriflora</u>	<u>2</u>	<u>No</u>	<u>OBL</u>		
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
Total Cover:	<u>130</u>				
50% of total cover:	<u>65</u>	20% of total cover:	<u>26</u>		
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>					
% Cover of Wetland Bryophytes <u>55</u> % Cover of Bryophytes <u>80</u>					
(Where applicable)					
Remarks: <u>Trace: Bet nan, Car can, Eri cha, Pol acu, Ste sit, Tri eur, lichen, water</u>					

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-17									hor:Oe

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/>
Type: None					
Depth (inches):					
Field Drainage Class: VPD - Very Poorly Drained					

Remarks: H2S at 5".

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Water Marks (B1)		<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Iron Deposits (B5)			<input checked="" type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input checked="" type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):					
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):	3.0				
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):	0.0				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hummocky.

Geomorphic Position:



Photo Name: Photo_180711120142



Photo Name: Photo_180711120059



Photo Name: Photo_180711120050

Additional Reference Data: Photos

HDR1112_18



Photo Name: Photo_180711120110



Photo Name: Photo_180711120131



Photo Name: Photo_180711120124

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/11/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1116_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>13</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.906925</u>	Long: <u>-155.359451</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Open Willow Low Shrub (OWLS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Salix barclayi</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Empetrum nigrum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>17</u> x2= <u>34</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>125</u> x3= <u>375</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>13</u> x4= <u>52</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>70</u>				Column Totals: <u>155</u> (A) <u>461</u> (B)
50% of total cover: <u>35</u>				Prevalence Index = B/A= <u>2.97</u>
20% of total cover: <u>14</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Sanguisorba canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Chamaenerion angustifolium</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Rhodiola integrifolia</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Rubus stellatus</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
7. <u>Achillea millefolium s.l.</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Rubus chamaemorus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	must be present, unless disturbed or problematic.
9. <u>Valeriana capitata</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u>Pyrola asarifolia</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>85</u>				
50% of total cover: <u>42.5</u>				
20% of total cover: <u>17</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u> </u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>60</u>				Present?
(Where applicable)				
Remarks:				
Trace: Luz par, Poa arc, Car pod, Car bru, Ang luc, Car umb, Dry exp, Pol acu, Gal bor, Ste lon, Tri eur, Vio lan.				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-2									hor:Oe
2-8	5YR 2.5/1	100					No	Silt Loam	hor:A
8-13	10YR 2/2	100					No	Loam	hor:B
13-19	10YR 4/2	70	5YR 4/6	30	C	M	No	Sandy Loam	hor:B/C Gravelly

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)		<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)		<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)		<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)		³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)		and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)		⁴ Give details of color change in Remarks.	

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type:	None				
Depth (inches):					
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):				
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):				
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Episaturation filling pit from above. Endosaturation present at 8". Water in pit filled to 4". Heavy recent rains.

Geomorphic Position:

Additional Reference Data: Photos

HDR1116_18



Photo Name: Photo_180711134406



Photo Name: Photo_180711134415



Photo Name: Photo_180711134411



Photo Name: Photo_180711134426



Photo Name: Photo_180711134421



Photo Name: Photo_180711134357

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	7/11/2018
Applicant/Owner:	PLP			Sampling Point:	HDR1118_18
Investigators:	ZH MD	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	Convex	Slope(%):	8	HGM:	N/A
Subregion (LRR):	X	Lat:	59.910328	Long:	-155.363083
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	U		

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.) _____

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			

Tree Stratum		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:			
1.					Number of Dominant Species			
2.					That Are OBL, FACW, or FAC: 4 (A)			
3.					Total Number of Dominant			
4.					Species Across All Strata: 5 (B)			
Total Cover: _____					Percent of Dominant Species			
50% of total cover: 0					That Are OBL, FACW, or FAC: 80 (A/B)			
20% of total cover: 0								
Sapling/Shrub Stratum					Prevalence Index worksheet:			
1.	Salix pulchra	35	Yes	FAC	Total % Cover of:		Multiply by:	
2.	Empetrum nigrum	25	Yes	FAC	OBL species	x1=		
3.	Vaccinium uliginosum	25	Yes	FAC	FACW species	4 x2=	8	
4.	Salix reticulata	15	No	FAC	FAC species	141 x3=	423	
5.	Betula nana	10	No	FAC	FACU species	x4=		
6.	Rhododendron tomentosum	2	No	FAC	UPL species	6 x5=	30	
Total Cover: 112					Column Totals:	151 (A)	461 (B)	
50% of total cover: 56					Prevalence Index = B/A= 3.05			
20% of total cover: 22.4								
Herb Stratum					Hydrophytic Vegetation Indicators:			
1.	Carex bigelowii	15	Yes	FAC	X	Dominance Test is >50%		
2.	Arnica lessingii	6	Yes	NL		Prevalence Index is ≤3.0		
3.	Carex microchaeta	5	No	FAC		Morphological Adaptations ¹ (Provide		
4.	Equisetum arvense	4	No	FAC		data in Remarks or on a separate sheet)		
5.	Festuca altaica	3	No	FAC		Problematic Hydrophytic Vegetation ¹ (Explain)		
6.	Calamagrostis canadensis	2	No	FAC				
7.	Rubus chamaemorus	2	No	FACW				
8.	Arctagrostis latifolia	1	No	FACW				
9.	Petasites frigidus s.l.	1	No	FACW				
10.								
Total Cover: 39					¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.			
50% of total cover: 19.5								
20% of total cover: 7.8								
Plot size (radius, or length x width) 1/10 acre					Hydrophytic Vegetation Present? Yes X No			
% Cover of Wetland Bryophytes T								
(Where applicable)								
% Cover of Bryophytes 60								

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Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-5									hor:Oe
5-18	10YR 3/3	100					No	Sandy Loam	hor:B/C Gravelly

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present): Type: <input type="checkbox"/> None Depth (inches): _____ Field Drainage Class: <input type="checkbox"/> WD - Well Drained	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
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Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> X <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): 8.0 Saturation Present? Yes <input type="checkbox"/> X <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): 3.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> X <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Episaturation present from 3 to 6", spilling into pit. Soil below is moist but not saturated.

Geomorphic Position:



Photo Name: Photo_180711151924



Photo Name: Photo_180711151853



Photo Name: Photo_180711151913

Additional Reference Data: Photos

HDR1118_18



Photo Name: Photo_180711151831



Photo Name: Photo_180711151902



Photo Name: Photo_180711151844

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/12/2018
 Applicant/Owner: PLP Sampling Point: HDR1120_18
 Investigators: ZH MD Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): None Slope(%): 15 HGM: Slope
 Subregion (LRR): X Lat: 59.899200 Long: -155.366699 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PEM1C

Vegetation Type: Bluejoint Herb (BH)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>75</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>8</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Salix pulchra</u>	<u>8</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Spiraea stevenii</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	FACW species <u>37</u> x2= <u>74</u>
4. <u>Harrimanella stelleriana</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	FAC species <u>46</u> x3= <u>138</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>11</u> x4= <u>44</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u>35</u> x5= <u>175</u>
Total Cover: <u>21</u>				Column Totals: <u>129</u> (A) <u>431</u> (B)
50% of total cover: <u>10.5</u>				Prevalence Index = B/A= <u>3.34</u>
20% of total cover: <u>4.2</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Luetkea pectinata</u>	<u>35</u>	<u>Yes</u>	<u>UPL</u>	<u>X</u> Dominance Test is >50%
2. <u>Sanguisorba canadensis</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>	Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Carex podocarpa</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Chamaenerion angustifolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Arctagrostis latifolia</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
7. <u>Carex micropoda</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Epilobium hornemannii</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	must be present, unless disturbed or problematic.
9. <u>Rhodiola integrifolia</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
10. <u>Rubus stellatus</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>108</u>				
50% of total cover: <u>54</u>				
20% of total cover: <u>21.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks: <u>Recently exposed snow field, vegetation is very young.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oe
4-14	10YR 3/3	100					N/A	Loamy Sand	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type: None			Yes	<input checked="" type="checkbox"/> No	
Depth (inches):					
Field Drainage Class: PD - Poorly Drained					

Remarks: H2S at 4".

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)					
<input checked="" type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input type="checkbox"/> Water Marks (B1)		<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input checked="" type="checkbox"/> Geomorphic Position (D2)		
<input checked="" type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input type="checkbox"/> Microtopographic Relief (D4)		
			<input type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input checked="" type="checkbox"/> No	Depth (inches):	2.0	
Water Table Present?	Yes	<input checked="" type="checkbox"/> No	Depth (inches):	0.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> No	Depth (inches):	0.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Iron staining observed on soil surface.

Geomorphic Position: Slope break with groundwater discharge occurring.

Additional Reference Data: Overflow Vegetation

HDR1120_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Dryopteris expansa	2	No	FACU
Veratrum viride	1	No	FAC
Angelica lucida	1	No	FACU

Additional Reference Data: Photos

HDR1120_18



Photo Name: Photo_180712081842



Photo Name: Photo_180712081749

Additional Reference Data: Photos

HDR1120_18



Photo Name: Photo_180712081716



Photo Name: Photo_180712081721



Photo Name: Photo_180712081804



Photo Name: Photo_180712081822

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/12/2018
 Applicant/Owner: PLP Sampling Point: HDR1124_18
 Investigators: ZH MD Landform (hillslope, terrace, etc.): Terrace
 Local Relief (concave, convex, none): None Slope(%): 5 HGM: N/A
 Subregion (LRR): X Lat: 59.900570 Long: -155.364166 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>80</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Alnus sinuata</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Empetrum nigrum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>43</u> x2= <u>86</u>
4. <u>Spiraea stevenii</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	FAC species <u>111</u> x3= <u>333</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>27</u> x4= <u>108</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>62</u>				Column Totals: <u>181</u> (A) <u>527</u> (B)
50% of total cover: <u>31</u>				Prevalence Index = B/A= <u>2.91</u>
20% of total cover: <u>12.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Sanguisorba canadensis</u>	<u>40</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Dominance Test is >50%
2. <u>Anemone richardsonii</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Lupinus nootkatensis</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Carex podocarpa</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Equisetum arvense</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	
7. <u>Trientalis europaea</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Rhodiola integrifolia</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Chamaenerion angustifolium</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
10. <u>Viola langsdorffii</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>119</u>				
50% of total cover: <u>59.5</u>				
20% of total cover: <u>23.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u>35</u>				
(Where applicable)				
Remarks:				
Trace: Sal bar, Vac uli, Poa arc, Luz par, Car big, Vah atr, Epi hor, Ver vir, Ath fel, Cha lat, Art arc, Pol acu, Mic nel, Ang luc, Car umb, Rub ste, Pyr min, Lichen.				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-5	7.5YR 3/3	100					N/A	Loamy Sand	hor:B/C
5-16	7.5YR 2.5/1	100					No	Silt Loam	hor:B/C Cobbles throughout.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: WD - Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
(includes capillary fringe)	
	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydro indicators observed. No evidence of flooding from nearby stream.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1124_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Viola epipsila	2	No	FAC
Dryopteris expansa	1	No	FACU
Geranium erianthum	1	No	FACU

Additional Reference Data: Photos

HDR1124_18



Photo Name: Photo_180712101028



Photo Name: Photo_180712101007



Photo Name: Photo_180712101019



Photo Name: Photo_180712101002



Photo Name: Photo_180712101046



Photo Name: Photo_180712101037

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/12/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1130_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>10</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u> Lat: <u>59.900131</u>	Long: <u>-155.366486</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1/EM1B</u>	

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>80</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Betula nana</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium uliginosum</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACW species <u>29</u> x2= <u>58</u>
4. <u>Spiraea stevenii</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	FAC species <u>118</u> x3= <u>354</u>
5. <u>Salix fuscescens</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	FACU species <u>30</u> x4= <u>120</u>
6. <u>Alnus sinuata</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>105</u>				Column Totals: <u>177</u> (A) <u>532</u> (B)
50% of total cover: <u>52.5</u>				Prevalence Index = B/A= <u>3.01</u>
20% of total cover: <u>21</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Geranium erianthum</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	Morphological Adaptations ¹ (Provide
4. <u>Empetrum nigrum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Equisetum sylvaticum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
7. <u>Chamaenerion angustifolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Rubus chamaemorus</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	must be present, unless disturbed or problematic.
9. <u>Petasites frigidus s.l.</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	
10. <u>Rubus stellatus</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>72</u>				
50% of total cover: <u>36</u>				
20% of total cover: <u>14.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u>5</u> % Cover of Bryophytes <u>20</u>				
(Where applicable)				
Remarks:				
<u>Trace: Car plu, Car aqu, Car bru, Luz par, Dry exp, Rum arc, Aco del, Com pal, Tri eur, Lyc ann, Pyr min. Lichen.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-9									hor:Oe
9-17	2.5Y 3/1	100					N/A	Sandy Loam	hor:A/B Cobbles

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No	<input type="checkbox"/>
Type: None						
Depth (inches):						
Field Drainage Class: PD - Poorly Drained						

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input checked="" type="checkbox"/> X Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> X FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No	<input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):					
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	8.0				
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	4.0				
(includes capillary fringe)						

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hummocky

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1130_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Rhodiola integrifolia	1	No	FAC
Viola langsdorffii	1	No	FACW

Additional Reference Data: Photos

HDR1130_18



Photo Name: Photo_180712124950



Photo Name: Photo_180712124932

Photo Name: Photo_180712125001



Photo Name: Photo_180712124912



Photo Name: Photo_180712124923



Photo Name: Photo_180712124940



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/12/2018
 Applicant/Owner: PLP Sampling Point: HDR1135_18
 Investigators: ZH MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 12 HGM: Slope
 Subregion (LRR): X Lat: 59.900536 Long: -155.367096 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1B

Vegetation Type: Closed Willow Tall Shrub (CWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Spiraea stevenii</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>15</u> x2= <u>30</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>186</u> x3= <u>558</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>16</u> x4= <u>64</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>90</u>				Column Totals: <u>217</u> (A) <u>652</u> (B)
50% of total cover: <u>45</u>				Prevalence Index = B/A= <u>3.00</u>
20% of total cover: <u>18</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Viola epipsila</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>15</u>	<u>No</u>	<u>FACW</u>	Morphological Adaptations ¹ (Provide
4. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Anemone richardsonii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Equisetum sylvaticum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
7. <u>Rubus stellatus</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Geranium erianthum</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	must be present, unless disturbed or problematic.
9. <u>Athyrium cyclosorum</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u>Dryopteris expansa</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>127</u>				
50% of total cover: <u>63.5</u>				
20% of total cover: <u>25.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u>35</u> % Cover of Bryophytes <u>55</u>				
(Where applicable)				

Remarks:
 Trace: Luz par, Cha ang, Com pal, Ang gen, Ver vir, Poa acu, Rum arc, Ang luc, Rho int, Tri eur, Epi hor, Car umb, Ste sit, Lichen.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-8									hor:Oe
8-11									hor:Oa
11-19	10GY 4/1	80	5YR 5/8	20	C	M	Yes	Loamy Sand	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input checked="" type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		
Type: None		
Depth (inches):		
Field Drainage Class: PD - Poorly Drained		
	Hydric Soil Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Remarks: H2S at 7".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):	
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	8.0
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	3.0
(includes capillary fringe)		
	Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Weeping in at 8".

Geomorphic Position:

Additional Reference Data: Photos

HDR1135_18



Photo Name: Photo_180712140043



Photo Name: Photo_180712140048



Photo Name: Photo_180712140032

Additional Reference Data: Photos

HDR1135_18



Photo Name: Photo_180712140026



Photo Name: Photo_180712140053



Photo Name: Photo_180712140038

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/12/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1140_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>15</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.899620</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Closed Willow Tall Shrub (CWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>90</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>32</u> x2= <u>64</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>166</u> x3= <u>498</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>13</u> x4= <u>52</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>95</u>				Column Totals: <u>211</u> (A) <u>614</u> (B)
50% of total cover: <u>47.5</u>				<u>Prevalence Index = B/A=</u> <u>2.91</u>
20% of total cover: <u>19</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Anemone richardsonii</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Equisetum pratense</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Valeriana capitata</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
7. <u>Viola epipsila</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Geranium erianthum</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	must be present, unless disturbed or problematic.
9. <u>Achillea millefolium s.l.</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
10. <u>Viola langsdoeffii</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>116</u>				
50% of total cover: <u>58</u>				
20% of total cover: <u>23.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u>25</u> % Cover of Bryophytes <u>45</u>				
(Where applicable)				
Remarks:				
Trace: Sal ric, Car sp., Ath fel, Ang luc, Dry exp, Aco del, Str amp, Eri per, Rum arc, Lis cor, Lyc ann, Iri set, Tri eur.				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-9									hor:Oe
9-13	10YR 3/2	100					No	Silt Loam	hor:A/B Cobbles throughout.
13-20	10YR 4/3	100					No	Sandy Loam	hor:B/C Cobbles throughout.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type:	None		Yes	<input checked="" type="checkbox"/> X	No
Depth (inches):					
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)					
<input type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input checked="" type="checkbox"/> X Geomorphic Position (D2)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input type="checkbox"/> Microtopographic Relief (D4)		
			<input checked="" type="checkbox"/> X FAC-Neutral Test (D5)		

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):	Yes	<input checked="" type="checkbox"/> X	No
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):			
Saturation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):			
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position: Slope break

Additional Reference Data: Overflow Vegetation

HDR1140_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Rhodiola integrifolia	1	No	FAC
Chamaenerion angustifolium	1	No	FACU

Additional Reference Data: Photos

HDR1140_18



Photo Name: Photo_180712153711



Photo Name: Photo_180712153701

Additional Reference Data: Photos

HDR1140_18



Photo Name: Photo_180712153706



Photo Name: Photo_180712153650



Photo Name: Photo_180712153656



Photo Name: Photo_180712153637

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/12/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1141_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>12</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.899120</u>	Long: <u>-155.355652</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra (DEST)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation. Transitional upland area, wetland located nearby downslope at slope break.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Salix pulchra</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Betula nana</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACW species <u>18</u> x2= <u>36</u>
4. <u>Vaccinium uliginosum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>124</u> x3= <u>372</u>
5. <u>Salix reticulata</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FACU species <u> </u> x4= <u> </u>
6. <u>Rhododendron tomentosum</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	UPL species <u>3</u> x5= <u>15</u>
Total Cover: <u>74</u>				Column Totals: <u>145</u> (A) <u>423</u> (B)
50% of total cover: <u>37</u>				<u>Prevalence Index = B/A=</u> <u>2.92</u>
20% of total cover: <u>14.8</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Carex podocarpa</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Rubus chamaemorus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
7. <u>Anemone richardsonii</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Polygonum viviparum</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Erigeron peregrinus</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
10. <u>Arnica lessingii</u>	<u>1</u>	<u>No</u>	<u>NL</u>	
Total Cover: <u>71</u>				
50% of total cover: <u>35.5</u>				
20% of total cover: <u>14.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-4									hor:Oe
4-8	10YR 3/3	95	7.5YR 3/4	5	C	M	No	Sandy Loam	hor:B
8-9	7.5YR 3/3	100					No	Loamy Sand	hor:B
9-10	10YR 4/1	30					No	Silt Loam	hor:Ab
9-10	10YR 2/1	70					No	Silt Loam	hor:Ab
10-13	10YR 4/2	100					No	Silt Loam	hor:B
13-19	10YR 4/4	100					No	Loamy Sand	hor:B/C Gravelly

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type:	None				
Depth (inches):					
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):				
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):				
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position: Toeslope.

Additional Reference Data: Overflow Vegetation

HDR1141_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Artemisia arctica	1	No	NL
Lagotis glauca s.l.	1	No	NL

Additional Reference Data: Photos

HDR1141_18



Photo Name: Photo_180712155922



Photo Name: Photo_180712155845

Additional Reference Data: Photos

HDR1141_18



Photo Name: Photo_180712155858



Photo Name: Photo_180712155941



Photo Name: Photo_180712155834



Photo Name: Photo_180712155909

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/13/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1142_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Bench</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>5</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.905800</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1/EM1B</u>	

Vegetation Type: Subarctic Sedge – Moss Wet Meadow (SSMWM)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u>70</u> <u>Multiply by:</u>
2. <u>Vaccinium uliginosum</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>70</u> x1= <u>70</u>
3. <u>Empetrum nigrum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>11</u> x2= <u>22</u>
4. <u>Salix reticulata</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>59</u> x3= <u>177</u>
5. <u>Salix fuscescens</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	FACU species <u> </u> x4= <u> </u>
6. <u>Betula nana</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>42</u>				Column Totals: <u>140</u> (A) <u>269</u> (B)
50% of total cover: <u>21</u>				<u>Prevalence Index = B/A=</u> <u>1.92</u>
20% of total cover: <u>8.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex pluriflora</u>	<u>65</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Comarum palustre</u>	<u>3</u>	<u>No</u>	<u>OBL</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Eriophorum angustifolium</u>	<u>2</u>	<u>No</u>	<u>OBL</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Anemone richardsonii</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
7. <u>Rubus stellatus</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Rubus chamaemorus</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>98</u>				
50% of total cover: <u>49</u>				
20% of total cover: <u>19.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-16									hor:Oe

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: None Depth (inches): Field Drainage Class: PD - Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks: H2S at 4".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 1.0 Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 5.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 3.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Solid rock at 16" = shallow aquitard. 1" surface water in low areas.

Geomorphic Position: Concave feature on hillslope bench.



Photo Name: Photo_180713081553



Photo Name: Photo_180713081623



Photo Name: Photo_180713081605

Additional Reference Data: Photos

HDR1142_18



Photo Name: Photo_180713081615



Photo Name: Photo_180713081636



Photo Name: Photo_180713081557

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/13/2018
 Applicant/Owner: PLP Sampling Point: HDR1143_18
 Investigators: ZH MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Convex Slope(%): 30 HGM: N/A
 Subregion (LRR): X Lat: 59.905907 Long: -155.371628 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Bluejoint Tall Grass (BTG)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>67</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Spiraea stevenii</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	FACW species <u>15</u> x2= <u>30</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>99</u> x3= <u>297</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>8</u> x4= <u>32</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>122</u> (A) <u>359</u> (B)
Total Cover: <u>10</u>				<u>Prevalence Index = B/A=</u> <u>2.94</u>
50% of total cover: <u>5</u>				
20% of total cover: <u>2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>90</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Sanguisorba canadensis</u>	<u>15</u>	<u>No</u>	<u>FACW</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Veratrum viride</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Achillea millefolium s.l.</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Chamaenerion angustifolium</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
7. <u>Trientalis europaea</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>112</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>56</u>				
20% of total cover: <u>22.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes ⁵ <u> </u>				
(Where applicable)				

Remarks:
 Trace: Bet nan, Rho tom, Vac uli, Sal arc, Poa arc, Ang luc, Aco del, Ger eri, Dry exp, Art arc, Pyr asa, Eri per, Rho int, Rub cha, Cor sue, Ste lon, Car umb, Lichen.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-20	7.5YR 2.5/2	100					No	Sandy Loam	hor:B/C Gravelly. Cobbles throughout.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: WD - Well Drained					

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	No	X
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydro indicators observed. Soil profile dry throughout.

Geomorphic Position:



Photo Name: Photo_180713085259



Photo Name: Photo_180713085319



Photo Name: Photo_180713085309



Photo Name: Photo_180713085242



Photo Name: Photo_180713085212



Photo Name: Photo_180713085206

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/13/2018
 Applicant/Owner: PLP Sampling Point: HDR1144_18
 Investigators: ZH MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 20 HGM: N/A
 Subregion (LRR): X Lat: 59.908550 Long: -155.365158 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Alder Tall Shrub (OATS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>67</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Alnus sinuata</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Ribes glandulosum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix pulchra</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>113</u> x3= <u>339</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>50</u> x4= <u>200</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>77</u>				Column Totals: <u>163</u> (A) <u>539</u> (B)
50% of total cover: <u>38.5</u>				Prevalence Index = B/A= <u>3.31</u>
20% of total cover: <u>15.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Dryopteris expansa</u>	<u>45</u>	<u>Yes</u>	<u>FACU</u>	<u>X</u> Dominance Test is >50%
2. <u>Athyrium cyclosum</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Chamaenerion angustifolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Calamagrostis canadensis</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>86</u>				
50% of total cover: <u>43</u>				
20% of total cover: <u>17.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes ⁸ <u> </u>				Vegetation
(Where applicable)				Yes <u>X</u> No <u> </u>
				Present?

Remarks:
 Trace: Gym dry, Str amp, Ver vir, Her lan, Ang luc, Equ arv.
 Several dead alder resulting in open vs. closed.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-19	7.5YR 3/3	100					N/A	Silt Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: MWD - Moderately Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X

Remarks: Profile moist but not saturated until 17". No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Saturation Present? Yes <input checked="" type="checkbox"/> X No <input type="checkbox"/> Depth (inches): 17.0	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Not saturated in upper 12" of the soil profile.

Geomorphic Position:

Additional Reference Data: Photos

HDR1144_18



Photo Name: Photo_180713093750



Photo Name: Photo_180713093807



Photo Name: Photo_180713093820



Photo Name: Photo_180713093759



Photo Name: Photo_180713093741



Photo Name: Photo_180713093812

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/13/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1148_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Bench</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>5</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u> Lat: <u>59.907562</u>	Long: <u>-155.365067</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Closed Willow Low Shrub (CWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species <u>3</u> x1= <u>3</u> FACW species <u>5</u> x2= <u>10</u> FAC species <u>161</u> x3= <u>483</u> FACU species _____ x4= _____ UPL species _____ x5= _____ Column Totals: <u>169</u> (A) <u>496</u> (B) <i>Prevalence Index = B/A=</i> <u>2.93</u>
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
Sapling/Shrub Stratum				
1. <u>Salix pulchra</u>	80	Yes	FAC	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
Total Cover: <u>80</u>				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
50% of total cover: <u>40</u>		20% of total cover: <u>16</u>		
Herb Stratum				
1. <u>Equisetum arvense</u>	55	Yes	FAC	
2. <u>Calamagrostis canadensis</u>	25	Yes	FAC	
3. <u>Sanguisorba canadensis</u>	3	No	FACW	
4. <u>Comarum palustre</u>	3	No	OBL	
5. <u>Viola epipsila</u>	1	No	FAC	
6. <u>Petasites frigidus s.l.</u>	1	No	FACW	
7. <u>Rumex arcticus</u>	1	No	FACW	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>89</u>				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
50% of total cover: <u>44.5</u>		20% of total cover: <u>17.8</u>		
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground _____				
% Cover of Wetland Bryophytes <u>20</u> % Cover of Bryophytes <u>25</u>				
(Where applicable)				
Remarks:				
Trace: Dry exp, Pol acu, Ver vir, Str amp, Sen tri, Her max, Epi hor, Chr tet, Ste sit, Car umb, The phe.				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-18									hor:Oe

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: None Depth (inches): Field Drainage Class: PD - Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks: H2S at 8".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 7.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 3.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

H2S at 8".

Geomorphic Position: Bench on hillslope.

Photo Name: Photo_180713110935



Photo Name: Photo_180713110909



Photo Name: Photo_180713110940



Photo Name: Photo_180713110948



Photo Name: Photo_180713110929



Photo Name: Photo_180713110903



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/13/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1149_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>5</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u> Lat: <u>59.905514</u>	Long: <u>-155.358810</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1/EM1C</u>	

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Prevalence Index worksheet:				
<u>Sapling/Shrub Stratum</u>				
1. <u>Empetrum nigrum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u>5</u> <u>Multiply by:</u> <u>5</u>
2. <u>Salix pulchra</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>5</u> x1= <u>5</u>
3. <u>Vaccinium uliginosum</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	FACW species <u>16</u> x2= <u>32</u>
4. <u>Spiraea stevenii</u>	<u>8</u>	<u>No</u>	<u>FACU</u>	FAC species <u>99</u> x3= <u>297</u>
5. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>9</u> x4= <u>36</u>
6. <u>Salix reticulata</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	UPL species <u>1</u> x5= <u>5</u>
Total Cover: <u>86</u>				Column Totals: <u>130</u> (A) <u>375</u> (B)
50% of total cover: <u>43</u>				<u>Prevalence Index = B/A=</u> <u>2.88</u>
20% of total cover: <u>17.2</u>				
<u>Herb Stratum</u>				
1. <u>Carex bigelowii</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators:
2. <u>Calamagrostis canadensis</u>	<u>8</u>	<u>Yes</u>	<u>FAC</u>	X Dominance Test is >50%
3. <u>Sanguisorba canadensis</u>	<u>8</u>	<u>Yes</u>	<u>FACW</u>	X Prevalence Index is ≤3.0
4. <u>Rubus stellatus</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
5. <u>Festuca altaica</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
6. <u>Carex membranacea</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
7. <u>Carex aquatilis</u>	<u>2</u>	<u>No</u>	<u>OBL</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
8. <u>Eriophorum angustifolium</u>	<u>2</u>	<u>No</u>	<u>OBL</u>	
9. <u>Rhodiola integrifolia</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u>Anemone narcissiflora</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>44</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>22</u>				
20% of total cover: <u>8.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u>15</u> % Cover of Bryophytes <u>50</u>				
(Where applicable)				

Remarks:

Trace: And pol, Vac vit, Eri cha, Jun cas, Luz mul, Poa arc, Bis plu, Ang luc, Ped sud, Sen lug, Rum arc, Aco del, Ped lab, Pet fri, Ped lan, Iri set, Sol mul, Tha alp, Pyr min, Ger eri, Bis viv, Vio epi, Tri eur, Val cap, Vio lan, Lag gla, Fri cam.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-8									hor:Oe
8-19	10YR 3/2	100					No	Sandy Loam	hor:B/C Gravelly

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		
Type: None		
Depth (inches):		
Field Drainage Class: PD - Poorly Drained		
	Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks: Hummocky. Plot placed in representative area.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 3.0		
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 5.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 2.0 (includes capillary fringe)		
	Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Inundation in low hummocks.

Geomorphic Position: Toeslope

Additional Reference Data: Overflow Vegetation

HDR1149_18

	Absolute % Cover	Dominant Species?	Indicator Status
Herb			
Carex saxatilis	1	No	FACW
Artemisia arctica	1	No	NL
Trichophorum caespitosum	1	No	OBL
Sapling/Shrub			
Salix fuscescens	5	No	FACW

Additional Reference Data: Photos

HDR1149_18



Photo Name: Photo_180713122636



Photo Name: Photo_180713122544



Photo Name: Photo_180713122555



Photo Name: Photo_180713122623



Photo Name: Photo_180713122603



Photo Name: Photo_180713122612

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/13/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1150_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>7</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.900986</u>	Long: <u>-155.355469</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Bluejoint Herb (BH)</u>		NWI Classification: <u>PEM1C</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If No, explain in Remarks)

Are Vegetation: ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation: ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>3</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> _____ <u>Multiply by:</u> _____
1. <u>Empetrum nigrum</u>	30	Yes	FAC	OBL species <u>5</u> x1= <u>5</u>
2. <u>Salix pulchra</u>	15	Yes	FAC	FACW species <u>19</u> x2= <u>38</u>
3. <u>Salix reticulata</u>	5	No	FAC	FAC species <u>134</u> x3= <u>402</u>
4. <u>Vaccinium uliginosum</u>	5	No	FAC	FACU species <u>3</u> x4= <u>12</u>
5. <u>Spiraea stevenii</u>	3	No	FACU	UPL species <u>1</u> x5= <u>5</u>
6. <u>Vaccinium vitis-idaea</u>	1	No	FAC	Column Totals: <u>162</u> (A) <u>462</u> (B)
Total Cover: <u>59</u>				Prevalence Index = B/A = <u>2.85</u>
50% of total cover: <u>29.5</u>				
20% of total cover: <u>11.8</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	55	Yes	FAC	<input checked="" type="checkbox"/> Dominance Test is >50%
2. <u>Carex bigelowii</u>	10	No	FAC	<input checked="" type="checkbox"/> Prevalence Index is ≤3.0
3. <u>Carex membranacea</u>	8	No	FACW	Morphological Adaptations ¹ (Provide
4. <u>Festuca altaica</u>	5	No	FAC	data in Remarks or on a separate sheet)
5. <u>Rubus stellatus</u>	5	No	FAC	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Petasites frigidus s.l.</u>	5	No	FACW	
7. <u>Eriophorum angustifolium</u>	5	No	OBL	¹ Indicators of hydric soil and wetland hydrology
8. <u>Rubus chamaemorus</u>	4	No	FACW	must be present, unless disturbed or problematic.
9. <u>Sanguisorba canadensis</u>	2	No	FACW	
10. <u>Equisetum arvense</u>	1	No	FAC	
Total Cover: <u>103</u>				
50% of total cover: <u>51.5</u>				
20% of total cover: <u>20.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes _____ % Cover of Bryophytes ⁰ _____				Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
(Where applicable)				Present?
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-9									hor:Oe
9-13	10YR 3/2	100					N/A	Silt Loam	hor:A/B Cobbles
13-19	7.5YR 3/3	100					N/A	Sandy Loam	hor:B/C Cobbles throughout.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type: None			Yes	<input checked="" type="checkbox"/> X	No
Depth (inches):					
Field Drainage Class: SPD - Somewhat Poorly Drained					

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)					
<input checked="" type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input checked="" type="checkbox"/> X Geomorphic Position (D2)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input type="checkbox"/> Microtopographic Relief (D4)		
			<input checked="" type="checkbox"/> X FAC-Neutral Test (D5)		

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	2.0	
Water Table Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	1.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	0.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
2" inundation in low areas.

Geomorphic Position: Toeslope.

Additional Reference Data: Overflow Vegetation

HDR1150_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Rhodiola integrifolia	1	No	FAC
Thalictrum alpinum	1	No	FAC
Arnica lessingii	1	No	NL

Additional Reference Data: Photos

HDR1150_18



Photo Name: Photo_180713134757



Photo Name: Photo_180713134718

Additional Reference Data: Photos

HDR1150_18

Photo Name: Photo_180713134829



Photo Name: Photo_180713134742



Photo Name: Photo_180713134822





Photo Name: Photo_180713134730

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/13/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1152_18</u>	
Investigators: <u>ZH MD</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>15</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.900936</u>	Long: <u>-155.355957</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>2</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Vaccinium uliginosum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Spiraea stevenii</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	FACW species <u>5</u> x2= <u>10</u>
4. <u>Betula nana</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FAC species <u>102</u> x3= <u>306</u>
5. <u>Salix pulchra</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	FACU species <u>10</u> x4= <u>40</u>
6. <u>Vaccinium vitis-idaea</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>85</u>				Column Totals: <u>117</u> (A) <u>356</u> (B)
50% of total cover: <u>42.5</u>				<u>Prevalence Index = B/A=</u> <u>3.04</u>
20% of total cover: <u>17</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex microchaeta</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Rubus chamaemorus</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	Morphological Adaptations ¹ (Provide
4. <u>Calamagrostis canadensis</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Equisetum arvense</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>32</u>				
50% of total cover: <u>16</u>				
20% of total cover: <u>6.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u> </u>				Vegetation
% Cover of Wetland Bryophytes <u>2</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>45</u>				Present?
(Where applicable)				

Remarks: Lichen at 4%. Trace: Rho tom, Fes alt, Poa arc, Ang luc, Dry exp, Bis plu, Rho int, Pyr min, Lyc ann, Art arc, San can, Tri eur, Rub ste.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-5									hor:Oe
5-13	7.5YR 2.5/1	100					No	Silt Loam	hor:A Small cobbles present.
13-19	10YR 3/3	100					No	Sandy Loam	hor:B/C Small cobbles present.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: MWD - Moderately Well Drained					

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	No	X
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	16.0			
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	14.0			
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary hydro indicators observed.

Geomorphic Position: Toeslope

Additional Reference Data: Photos

HDR1152_18



Photo Name: Photo_180713143121



Photo Name: Photo_180713143136



Photo Name: Photo_180713143147



Photo Name: Photo_180713143215



Photo Name: Photo_180713143200



Photo Name: Photo_180713143112

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/13/2018
 Applicant/Owner: PLP Sampling Point: HDR1153_18
 Investigators: ZH MSD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 15 HGM: N/A
 Subregion (LRR): X Lat: 59.898928 Long: -155.357669 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Closed Alder Tall Shrub (CATS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u> </u>	No <u>X</u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>1</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>33</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Alnus sinuata</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Salix pulchra</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>8</u> x2= <u>16</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>124</u> x3= <u>372</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>65</u> x4= <u>260</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u>3</u> x5= <u>15</u>
Total Cover: <u>83</u>				Column Totals: <u>200</u> (A) <u>663</u> (B)
50% of total cover: <u>41.5</u>				<u>Prevalence Index = B/A=</u> <u>3.32</u>
20% of total cover: <u>16.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Dryopteris expansa</u>	<u>35</u>	<u>Yes</u>	<u>FACU</u>	Dominance Test is >50%
2. <u>Thelypteris phegopteris</u>	<u>30</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Viola epipsila</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Sanguisorba canadensis</u>	<u>8</u>	<u>No</u>	<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Anemone richardsonii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
7. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Viola selkirkii</u>	<u>3</u>	<u>No</u>	<u>NL</u>	must be present, unless disturbed or problematic.
9. <u>Rubus stellatus</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>117</u>				
50% of total cover: <u>58.5</u>				
20% of total cover: <u>23.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic
% Cover of Wetland Bryophytes <u>3</u> % Cover of Bryophytes <u>20</u>				Vegetation
(Where applicable)				Yes <u> </u> No <u> </u> X <u> </u>
				Present?

Remarks:
 Trace: Sal ric, Str amp, Ver vir, Pyr asa, Cha ang, Ang luc, Lyc ann, Sen tri, Tri eur, Ste sit, Aco del, Ado mos, Lichen.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-8	7.5YR 2.5/1	100					No	Silt Loam	hor:A Cobble throughout.
8-18	7.5YR 3/2	100					No	Sandy Loam	hor:B/C Cobble throughout.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			
Type: None			
Depth (inches):			
Field Drainage Class: WD - Well Drained			
		Hydric Soil Present?	Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches):		
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches):		
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches):		
(includes capillary fringe)		
		Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydro indicators observed.

Geomorphic Position:

Additional Reference Data: Photos

HDR1153_18



Photo Name: Photo_180713153605



Photo Name: Photo_180713153554



Photo Name: Photo_180713153538

Additional Reference Data: Photos

HDR1153_18



Photo Name: Photo_180713153600



Photo Name: Photo_180713153549

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/20/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1200_18</u>	
Investigators: <u>ZH AH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>Convex</u>	Slope(%): <u>9</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u> Lat: <u>59.900467</u>	Long: <u>-155.336868</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>U</u>	

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Betula nana</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACW species <u>10</u> x2= <u>20</u>
4. <u>Rhododendron tomentosum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>107</u> x3= <u>321</u>
5. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>7</u> x4= <u>28</u>
6. <u>Arctostaphylos alpina</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>111</u>				Column Totals: <u>124</u> (A) <u>369</u> (B)
50% of total cover: <u>55.5</u>				<u>Prevalence Index = B/A=</u> <u>2.98</u>
20% of total cover: <u>22.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex macrochaeta</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>3</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>13</u>				
50% of total cover: <u>6.5</u>				
20% of total cover: <u>2.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>5</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>10</u>				Present?
(Where applicable)				
Remarks: <u>Lichen at 30%.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2							N/A		hor:Oe Wavy boundary down to 4".
2-20	10YR 3/3	50					No	Sandy Loam	hor:B/C *2
2-20	10YR 3/4	50					No	Sandy Loam	hor:B/C *3

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: WD - Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X

Remarks: No hydric soil indicators observed. *2: 5% medium sub angular gravel and 10% coarse subangular gravel. *3: 5% medium sub angular gravel and 10% coarse subangular gravel.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
(includes capillary fringe)	
	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydro indicators observed.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1200_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Loiseleuria procumbens	3	No	FACU
Spiraea stevenii	3	No	FACU
Vaccinium vitis-idaea	1	No	FAC
Picea glauca	1	No	FACU

Additional Reference Data: Photos

HDR1200_18



Photo Name: Photo_180720085810



Photo Name: Photo_180720085705



Photo Name: Photo_180720085716



Photo Name: Photo_180720085730



Photo Name: Photo_180720085801



Photo Name: Photo_180720085649

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/20/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1202_18</u>	
Investigators: <u>ZH, AH</u>	Landform (hillslope, terrace, etc.): <u>Footslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>5</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.900223</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1/EM1C</u>	

Vegetation Type: Subarctic Sedge – Moss Wet Meadow (SSMWM)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix fuscescens</u>	<u>40</u>	<u>Yes</u>	<u>FACW</u>	<u>Total % Cover of:</u> <u>105</u> <u>Multiply by:</u> <u>105</u>
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	OBL species <u>105</u> x1= <u>105</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>42</u> x2= <u>84</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>20</u> x3= <u>60</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u> </u> x4= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>40</u>				Column Totals: <u>167</u> (A) <u>249</u> (B)
50% of total cover: <u>20</u>				<u>Prevalence Index = B/A=</u> <u>1.49</u>
20% of total cover: <u>8</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex pluriflora</u>	<u>65</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Dominance Test is >50%
2. <u>Comarum palustre</u>	<u>40</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Eriophorum russeolum s.l.</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>127</u>				
50% of total cover: <u>63.5</u>				
20% of total cover: <u>25.4</u>				
Plot size (radius, or length x width) <u>20 x 20 ft</u>				
% Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u>80</u>				
% Cover of Bryophytes <u>80</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-5							N/A		hor:Oi
5-18							N/A		hor:Oe Few cobbles at 18inches.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: None Depth (inches): Field Drainage Class: PD - Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks: H2S at 6". Few cobbles at 18".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 1.0 Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 3.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 1.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
1" surface water in low areas.

Geomorphic Position: Concave area on footslope.



Photo Name: Photo_180720095910



Photo Name: Photo_180720100125



Photo Name: Photo_180720095932

Additional Reference Data: Photos

HDR1202_18



Photo Name: Photo_180720100041



Photo Name: Photo_180720100031



Photo Name: Photo_180720100005

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/20/2018
 Applicant/Owner: PLP Sampling Point: HDR1203_18
 Investigators: ZH AH Landform (hillslope, terrace, etc.): Footslope
 Local Relief (concave, convex, none): Concave Slope(%): 6 HGM: Slope
 Subregion (LRR): X Lat: 59.899540 Long: -155.338272 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS3/EM1C

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Prevalence Index worksheet:				
<u>Sapling/Shrub Stratum</u>		Total % Cover of: <u> </u> Multiply by:		
1. <u>Empetrum nigrum</u>	<u>45</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>5</u> x1= <u>5</u>
2. <u>Vaccinium uliginosum</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACW species <u>8</u> x2= <u>16</u>
3. <u>Betula nana</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FAC species <u>109</u> x3= <u>327</u>
4. <u>Rhododendron tomentosum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>1</u> x4= <u>4</u>
5. <u>Salix pulchra</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
6. <u>Vaccinium vitis-idaea</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	Column Totals: <u>123</u> (A) <u>352</u> (B)
Total Cover: <u>80</u>				
50% of total cover: <u>40</u>				Prevalence Index = B/A= <u>2.86</u>
20% of total cover: <u>16</u>				
Hydrophytic Vegetation Indicators:				
1. <u>Carex bigelowii</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Festuca altaica</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Rumex arcticus</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
5. <u>Carex aquatilis</u>	<u>5</u>	<u>No</u>	<u>OBL</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Carex macrochaeta</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>43</u>				
50% of total cover: <u>21.5</u>				
20% of total cover: <u>8.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u>15</u>		% Cover of Bryophytes <u>15</u>		
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-7									hor:Oe
7-8									hor:Oa
8-20	10YR 3/3	100					No	Sandy Loam	hor:B/C *4

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type: None			Yes	<input checked="" type="checkbox"/> X	No
Depth (inches):					
Field Drainage Class: SPD - Somewhat Poorly Drained					

Remarks: H2S in low areas. Soil also interpreted as ponded or flooded for 14 or more consecutive days during growing season. Inundation visible on 2004 imagery, 3PP on-site photographs from 2008, and onsite HDR observations from 2018. Close to meeting histic epipedon but chroma of underlying mineral layer one chroma too high. *4: Alpha alpha tested and turned positive after 1 minute. 5% coarse gravel and 30% coarse cobble.

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)					
<input checked="" type="checkbox"/> Surface Water (A1)		<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)		<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)		<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)		<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)		<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)		<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)				<input checked="" type="checkbox"/> X Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)				<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)				<input checked="" type="checkbox"/> X Microtopographic Relief (D4)	
				<input checked="" type="checkbox"/> X FAC-Neutral Test (D5)	

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	3.0	
Water Table Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	8.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	7.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
3" Surface water present in low areas.

Geomorphic Position: Slightly concave area on footslope bench.

Additional Reference Data: Overflow Vegetation

HDR1203_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Spiraea stevenii</u>	<u>1</u>	<u>No</u>	<u>FACU</u>

Additional Reference Data: Photos

HDR1203_18



Photo Name: Photo_180720122539



Photo Name: Photo_180720122513



Photo Name: Photo_180720122531



Photo Name: Photo_180720122548



Photo Name: Photo_180720122558



Photo Name: Photo_180720122606

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/20/2018
 Applicant/Owner: PLP Sampling Point: HDR1204_18
 Investigators: ZH AH Landform (hillslope, terrace, etc.): Footslope
 Local Relief (concave, convex, none): None Slope(%): 10 HGM: N/A
 Subregion (LRR): X Lat: 59.898865 Long: -155.339676 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>2</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Vaccinium uliginosum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>3</u> x2= <u>6</u>
4. <u>Rhododendron tomentosum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>95</u> x3= <u>285</u>
5. <u>Arctostaphylos alpina</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FACU species <u>3</u> x4= <u>12</u>
6. <u>Carex macrochaeta</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>101</u>				Column Totals: <u>101</u> (A) <u>303</u> (B)
50% of total cover: <u>50.5</u>				Prevalence Index = B/A= <u>3.00</u>
20% of total cover: <u>20.2</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u>X</u> Dominance Test is >50%
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u>X</u> Prevalence Index is ≤3.0
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				
50% of total cover: <u>0</u>				
20% of total cover: <u>0</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u> </u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>20</u>				Present?
(Where applicable)				
Remarks: <u>Lichen at 20%. Bis plu and Car mac added to shrub stratum because herb stratum had < 5% cover.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oe
4-13	10YR 2/2	100					No	Sandy Loam	hor:A
13-20	10YR 4/4	100					No	Sandy Clay Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: WD - Well Drained					

Remarks: 25% coarse and 5% medium gravel from 4" to 20". No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	No	X
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydro indicators observed.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1204_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Salix pulchra	1	No	FAC
Vaccinium vitis-idaea	1	No	FAC
Bistorta plumosa	1	No	FACU
Loiseleuria procumbens	1	No	FACU
Spiraea stevenii	1	No	FACU

Additional Reference Data: Photos

HDR1204_18



Photo Name: Photo_180720132336



Photo Name: Photo_180720132345



Photo Name: Photo_180720132407



Photo Name: Photo_180720132400



Photo Name: Photo_180720132415

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/20/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1206_18</u>	
Investigators: <u>ZH, AH</u>	Landform (hillslope, terrace, etc.): <u>Footslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>5</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.897800</u>	Long: <u>-155.343964</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
NW1 Classification: <u>U</u>		

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Rhododendron tomentosum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium uliginosum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>15</u> x2= <u>30</u>
4. <u>Arctostaphylos alpina</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>184</u> x3= <u>552</u>
5. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>7</u> x4= <u>28</u>
6. <u>Salix pulchra</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>166</u>				Column Totals: <u>206</u> (A) <u>610</u> (B)
50% of total cover: <u>83</u>				<u>Prevalence Index = B/A=</u> <u>2.96</u>
20% of total cover: <u>33.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex macrochaeta</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Lycopodium annotinum s.l.</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Cornus suecica</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Lupinus nootkatensis</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
7. <u>Luzula multiflora</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Juncus sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>41</u>				
50% of total cover: <u>20.5</u>				
20% of total cover: <u>8.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>10</u>				Present?
(Where applicable)				
Remarks:				
<u>Lichen cover 25%</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2							N/A		hor:Oi
2-4							N/A		hor:Oe
4-8	10YR3/3	100					No	Sandy Loam	hor:B/C 20% gravel.
8-20	10YR 4/4	100					No	Sandy Clay Loam	hor:B/C 20% gravel.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: None. Depth (inches): Field Drainage Class: MWD - Moderately Well Drained	Hydric Soil Present? Yes No X
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Remarks: Very moist from 4" to 8", drier below. No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes No X Depth (inches): Water Table Present? Yes No X Depth (inches): Saturation Present? Yes No X Depth (inches): (includes capillary fringe)	Wetland Hydrology Present? Yes No X
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Very moist from 4" to 8", drier below.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1206_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<i>Loiseleuria procumbens</i>	2	No	FACU
<i>Vaccinium vitis-idaea</i>	1	No	FAC
<i>Picea glauca</i>	1	No	FACU

Additional Reference Data: Photos

HDR1206_18



Photo Name: Photo_180720145245



Photo Name: Photo_180720145215

Additional Reference Data: Photos

HDR1206_18



Photo Name: Photo_180720145316



Photo Name: Photo_180720145155



Photo Name: Photo_180720145328



Photo Name: Photo_180720145306

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/20/2018
 Applicant/Owner: PLP Sampling Point: HDR1207_18
 Investigators: ZH AH Landform (hillslope, terrace, etc.): Footslope
 Local Relief (concave, convex, none): None Slope(%): 5 HGM: N/A
 Subregion (LRR): X Lat: 59.896652 Long: -155.349243 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>75</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Rhododendron tomentosum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>15</u> x2= <u>30</u>
4. <u>Vaccinium uliginosum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FAC species <u>98</u> x3= <u>294</u>
5. <u>Salix pulchra</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	FACU species <u>8</u> x4= <u>32</u>
6. <u>Picea glauca</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	UPL species <u>1</u> x5= <u>5</u>
Total Cover: <u>91</u>				Column Totals: <u>122</u> (A) <u>361</u> (B)
50% of total cover: <u>45.5</u>				<u>Prevalence Index = B/A=</u> <u>2.96</u>
20% of total cover: <u>18.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex macrochaeta</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Anemone narcissiflora</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Festuca altaica</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Cornus suecica</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Lycopodium annotinum s.l.</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
7. <u>Hierochloe alpina</u>	<u>1</u>	<u>No</u>	<u>NL</u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>31</u>				
50% of total cover: <u>15.5</u>				
20% of total cover: <u>6.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes ⁵ <u> </u>				
(Where applicable)				
Remarks: <u>Lichen 5%</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oe
3-4									hor:Oa
4-18	7.5YR 2.5/2	100					No	Loam	hor:A Moist but not saturated.
18-20	5YR 2.5/2	100					N/A	Sandy Loam	hor:B Dry.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: WD - Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Remarks: Moist at 4 to 8 inches, dry otherwise. Coarse gravel at 5%. No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
(includes capillary fringe)	
	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydro indicators observed.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1207_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Spiraea stevenii</u>	<u>1</u>	<u>No</u>	<u>FACU</u>

Additional Reference Data: Photos

HDR1207_18



Photo Name: Photo_180720153742



Photo Name: Photo_180720153716



Photo Name: Photo_180720153710



Photo Name: Photo_180720153727



Photo Name: Photo_180720153734



Photo Name: Photo_180720153754

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/20/2018
 Applicant/Owner: PLP Sampling Point: HDR1208_18
 Investigators: ZH AH Landform (hillslope, terrace, etc.): Footslope
 Local Relief (concave, convex, none): None Slope(%): 10 HGM: N/A
 Subregion (LRR): X Lat: 59.896469 Long: -155.348282 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Betula nana</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FACW species <u>11</u> x2= <u>22</u>
4. <u>Spiraea stevenii</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	FAC species <u>88</u> x3= <u>264</u>
5. <u>Arctostaphylos alpina</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	FACU species <u>8</u> x4= <u>32</u>
6. <u>Salix pulchra</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>80</u>				Column Totals: <u>107</u> (A) <u>318</u> (B)
50% of total cover: <u>40</u>				Prevalence Index = B/A= <u>2.97</u>
20% of total cover: <u>16</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex macrochaeta</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Cornus suecica</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Anemone richardsonii</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Bistorta plumosa</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Lupinus nootkatensis</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
7. <u>Arnica sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>28</u>				
50% of total cover: <u>14</u>				
20% of total cover: <u>5.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oe
2-6	7.5YR 2.5/2	100					No	Sandy Loam	hor:A
6-20	10YR 3/3	100					No	Sandy Loam	hor:B *3

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X
Type: None		
Depth (inches):		
Field Drainage Class: WD - Well Drained		

Remarks: No hydric soil indicators observed. *3: 5% small/medium/ course gravels.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):		
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 6.0		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Saturated at 6", water very slow to weep, no water in pit after 20 minutes.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1208_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Loiseleuria procumbens	1	No	FACU
Salix fuscescens	1	No	FACW

Additional Reference Data: Photos

HDR1208_18



Photo Name: Photo_180720161217



Photo Name: Photo_180720161057

Additional Reference Data: Photos

HDR1208_18



Photo Name: Photo_180720161131



Photo Name: Photo_180720161041



Photo Name: Photo_180720161200

Additional Reference Data: Photos

HDR1208_18



Photo Name: Photo_180720161113



Photo Name: Photo_180720161014

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/21/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1209_18</u>	
Investigators: <u>ZH AH</u>	Landform (hillslope, terrace, etc.): <u>Footslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>7</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.888767</u>	Long: <u>-155.349197</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra – Carex (DEST-C)</u>		NWI Classification: <u>PSS3/EM1C</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>8</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>10</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>80</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by: <u> </u>
2. <u>Salix pulchra</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>21</u> x1= <u>21</u>
3. <u>Vaccinium uliginosum</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>22</u> x2= <u>44</u>
4. <u>Betula nana</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FAC species <u>112</u> x3= <u>336</u>
5. <u>Salix fuscescens</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	FACU species <u>3</u> x4= <u>12</u>
6. <u>Rhododendron tomentosum</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	UPL species <u>23</u> x5= <u>115</u>
Total Cover: <u>81</u>				Column Totals: <u>181</u> (A) <u>528</u> (B)
50% of total cover: <u>40.5</u>				Prevalence Index = B/A= <u>2.92</u>
20% of total cover: <u>16.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Trichophorum caespitosum</u>	<u>20</u>	<u>Yes</u>	<u>OBL</u>	X Dominance Test is >50%
2. <u>Carex macrochaeta</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>	X Prevalence Index is ≤3.0
3. <u>Anemone richardsonii</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Sedum rosea ssp. integrifolium</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Artemisia arctica</u>	<u>10</u>	<u>Yes</u>	<u>NL</u>	
7. <u>Lagotis glauca s.l.</u>	<u>10</u>	<u>Yes</u>	<u>NL</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Festuca altaica</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Angelica lucida</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
10. <u>Hierochloe odorata</u>	<u>3</u>	<u>No</u>	<u>NL</u>	
Total Cover: <u>104</u>				
50% of total cover: <u>52</u>				
20% of total cover: <u>20.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u> </u>				Vegetation
% Cover of Wetland Bryophytes <u>20</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes ³⁰ <u> </u>				Present?
(Where applicable)				

Remarks: DEST-C with cutpoint of OMSST- pockets of trichopherum tussocks with surface water, but 20% overall coverage.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2							N/A		hor:Oi
2-9							N/A		hor:Oe
9-18	7.5YR 2.5/2	100					No	Loam	hor:A *3
18-20	7.5YR 2.5/3	100					No	Loamy Sand	hor:A/B 2% medium gravel.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: None. Depth (inches): Field Drainage Class: PD - Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks: H2S at 10 inches. *3: With organic fibers. 2% medium gravel.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 1.0 Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 1.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Seeps located upslope. Groundwater discharge observed within feature.

Geomorphic Position: Linear concave feature on footslope.

Additional Reference Data: Overflow Vegetation

HDR1209_18

	Absolute % Cover	Dominant Species?	Indicator Status
Herb			
Senecio sp.	3	No	NULL
Carex bigelowii	1	No	FAC
Cornus suecica	1	No	FAC
Eriqeron peregrinus	1	No	FACW
Pedicularis langsdorfii	1	No	FACW
Viola langsdorffii	1	No	FACW
Arnica sp.	1	No	N/A
Eriophorum angustifolium	1	No	OBL
Sapling/Shrub			
Vaccinium vitis-idaea	1	No	FAC
Andromeda polifolia	1	No	FACW

Additional Reference Data: Photos

HDR1209_18



Photo Name: Photo_180721091028



Photo Name: Photo_180721091122

Additional Reference Data: Photos

HDR1209_18



Photo Name: Photo_180721090758



Photo Name: Photo_180721091147



Photo Name: Photo_180721091134



Photo Name: Photo_180721091109

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/21/2018
 Applicant/Owner: PLP Sampling Point: HDR1211_18
 Investigators: ZH AH Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Convex Slope(%): 17 HGM: N/A
 Subregion (LRR): X Lat: 59.889656 Long: -155.353424 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>		
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Salix arctica</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium uliginosum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>3</u> x2= <u>6</u>
4. <u>Loiseleuria procumbens</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	FAC species <u>123</u> x3= <u>369</u>
5. <u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	FACU species <u>12</u> x4= <u>48</u>
6. <u>Betula nana</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	UPL species <u>3</u> x5= <u>15</u>
Total Cover: <u>104</u>				Column Totals: <u>141</u> (A) <u>438</u> (B)
50% of total cover: <u>52</u>				<u>Prevalence Index = B/A=</u> <u>3.11</u>
20% of total cover: <u>20.8</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Cornus suecica</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Sedum rosea ssp. integrifolium</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Sanguisorba canadensis</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Artemisia arctica</u>	<u>3</u>	<u>No</u>	<u>NL</u>	
7. <u>Equisetum arvense</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Thalictrum alpinum</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Viola epipsila</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u>Angelica lucida</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>37</u>				
50% of total cover: <u>18.5</u>				
20% of total cover: <u>7.4</u>				
Plot size (radius, or length x width) <u>10 x 10 ft</u>				Hydrophytic
% Bare Ground <u>5</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes ⁵ <u> </u>				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oe
1-2	7.5YR 2.5/2	100					N/A	Sandy Loam	hor:A
2-20	10YR 4/4	100					N/A	Sandy Loam	hor:B/C *3

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: WD - Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Remarks: No hydric soil indicators observed. *3: 20% medium and coarse rounded and subangular gravel. Profile too dry for alpha alpha test.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):	
(includes capillary fringe)	
	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydro indicators observed. Soil profile dry throughout.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1211_18

	Absolute % Cover	Dominant Species?	Indicator Status
Herb			
<u>Lycopodium annotinum s.l.</u>	<u>1</u>	<u>No</u>	<u>FACU</u>
Sapling/Shrub			
<u>Rhododendron tomentosum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>
<u>Salix pulchra</u>	<u>3</u>	<u>No</u>	<u>FAC</u>

Additional Reference Data: Photos

HDR1211_18



Photo Name: Photo_180721105618



Photo Name: Photo_180721105547

Additional Reference Data: Photos

HDR1211_18



Photo Name: Photo_180721105642



Photo Name: Photo_180721105557



Photo Name: Photo_180721105629



Photo Name: Photo_180721105611

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/21/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1212_18</u>	
Investigators: <u>ZH, AH</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>7</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.889683</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PEM1C</u>	

Vegetation Type: Subarctic Sedge – Moss Wet Meadow (SSMWM)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix fuscescens</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>	<u>Total % Cover of:</u> <u>103</u> <u>Multiply by:</u>
2. <u>Salix pulchra</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>103</u> x1= <u>103</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>34</u> x2= <u>68</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>15</u> x3= <u>45</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u> </u> x4= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>40</u>				Column Totals: <u>152</u> (A) <u>216</u> (B)
50% of total cover: <u>20</u>				<u>Prevalence Index = B/A=</u> <u>1.42</u>
20% of total cover: <u>8</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex aquatilis</u>	<u>50</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Dominance Test is >50%
2. <u>Comarum palustre</u>	<u>50</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Sanguisorba canadensis</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Trichophorum caespitosum</u>	<u>2</u>	<u>No</u>	<u>OBL</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Festuca altaica</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
7. <u>Micranthes nelsoniana</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Sedum rosea ssp. integrifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Equisetum variegatum</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
10. <u>Rumex arcticus</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>113</u>				
50% of total cover: <u>56.5</u>				
20% of total cover: <u>22.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-12							N/A		hor:Oe
12-20	5Y3/2	100					Yes	Sandy Loam	hor:B/C 15% cobble.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: <input type="text" value="None"/> Depth (inches): <input type="text"/> Field Drainage Class: <input type="text" value="PD - Poorly Drained"/>	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks: H2S at 5".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input checked="" type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <input type="text" value="2.0"/> Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <input type="text" value="1.0"/> Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <input type="text" value="0.0"/> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
2" surface water present in low areas. Groundwater discharge observed at slope break.

Geomorphic Position: Toeslope

Additional Reference Data: Overflow Vegetation

HDR1212_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Viola sp.	1	No	N/A
Eriophorum anqustifolium	1	No	OBL

Additional Reference Data: Photos

HDR1212_18



Photo Name: Photo_180721113634



Photo Name: Photo_180721113702



Photo Name: Photo_180721113753



Photo Name: Photo_180721113820



Photo Name: Photo_180721113646



Photo Name: Photo_180721113732

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/21/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1213_18</u>	
Investigators: <u>ZH AH</u>	Landform (hillslope, terrace, etc.): <u>Footslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>8</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.891823</u>	Long: <u>-155.346863</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
NW1 Classification: <u>U</u>		

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>67</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Rhododendron tomentosum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
4. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>119</u> x3= <u>357</u>
5. <u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>18</u> x4= <u>72</u>
6. <u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	UPL species <u>3</u> x5= <u>15</u>
Total Cover: <u>122</u>				Column Totals: <u>140</u> (A) <u>444</u> (B)
50% of total cover: <u>61</u>				<u>Prevalence Index = B/A=</u> <u>3.17</u>
20% of total cover: <u>24.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Bistorta plumosa</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Anemone narcissiflora</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Hierochloe odorata</u>	<u>3</u>	<u>No</u>	<u>NL</u>	data in Remarks or on a separate sheet)
5. <u>Aconitum delphinifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Lupinus nootkatensis</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>18</u>				
50% of total cover: <u>9</u>				
20% of total cover: <u>3.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>5</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes <u>10</u>				
(Where applicable)				
Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>				
Remarks: <u>15% Lichen.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oe
3-4									hor:Oa
4-6	7.5YR 2.5/2	100					No	Loam	hor:A
6-12	7.5YR 2.5/3	100					No	Sandy Loam	hor:B
12-21	10YR 3/6	100					No	Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: MWD - Moderately Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X

Remarks: 16" to 21" 15% medium and course gravel. No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 21.0	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 6.0	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Soil profile very slow to discharge water. Depth to water in pit at 21" after 15 minutes.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1213_18

Sapling/Shrub	Absolute % Cover	Dominant Species?	Indicator Status
Betula nana	3	No	FAC
Loiseleuria procumbens	3	No	FACU
Picea glauca	1	No	FACU

Additional Reference Data: Photos

HDR1213_18



Photo Name: Photo_180721124750



Photo Name: Photo_180721124640



Photo Name: Photo_180721124628



Photo Name: Photo_180721124731



Photo Name: Photo_180721124819

Additional Reference Data: Photos

HDR1213_18



Photo Name: Photo_180721124835



Photo Name: Photo_180721124852

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/21/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1215_18</u>	
Investigators: <u>ZH, AH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>10</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.890808</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Closed Alder – Willow Low Shrub (CAWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
<u>Tree Stratum</u>				Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>4</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		That Are OBL, FACW, or FAC: <u>100</u> (A/B)
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u>1</u> <u>Multiply by:</u>
2. <u>Alnus sinuata</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>1</u> x1= <u>1</u>
3. <u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	FACW species <u>4</u> x2= <u>8</u>
4. <u>Betula glandulosa</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FAC species <u>195</u> x3= <u>585</u>
5. <u>Betula nana</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FACU species <u>20</u> x4= <u>80</u>
6. <u>Vaccinium vitis-idaea</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	UPL species _____ x5= _____
Total Cover: <u>90</u>				Column Totals: <u>220</u> (A) <u>674</u> (B)
50% of total cover: <u>45</u>		20% of total cover: <u>18</u>		<u>Prevalence Index = B/A=</u> <u>3.06</u>
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	<input checked="" type="checkbox"/> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<input type="checkbox"/> Prevalence Index is ≤3.0
3. <u>Dryopteris expansa</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	<input type="checkbox"/> Morphological Adaptations ¹ (Provide
4. <u>Lycopodium annotinum s.l.</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Chamaenerion angustifolium</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Rubus chamaemorus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
7. <u>Sanguisorba canadensis</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Comarum palustre</u>	<u>1</u>	<u>No</u>	<u>OBL</u>	must be present, unless disturbed or problematic.
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>130</u>				
50% of total cover: <u>65</u>		20% of total cover: <u>26</u>		
Plot size (radius, or length x width) <u>15 x 30 ft</u>		% Bare Ground <u>0</u>		Hydrophytic
% Cover of Wetland Bryophytes <u>2</u>		% Cover of Bryophytes ² _____		Vegetation
(Where applicable)				Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Present?				
Remarks: <u>Some dead standing alder present.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-9							N/A		hor:Oe
9-18	5Y4/1	80	5YR 3/4	20	C	M RC	Yes	Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input checked="" type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type:	None		Yes	<input checked="" type="checkbox"/> X	No
Depth (inches):					
Field Drainage Class:	PD - Poorly Drained				

Remarks: H2S at 5 inches.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input checked="" type="checkbox"/> X Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> X Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):	Yes	<input checked="" type="checkbox"/> X	No
Water Table Present?	Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):			
Saturation Present?	Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):			
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Water weeping in at 8 inches.

Geomorphic Position:

Additional Reference Data: Photos

HDR1215_18



Photo Name: Photo_180721142727



Photo Name: Photo_180721142737



Photo Name: Photo_180721142718

Additional Reference Data: Photos

HDR1215_18



Photo Name: Photo_180721142704



Photo Name: Photo_180721142651



Photo Name: Photo_180721142712

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/21/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1216_18</u>	
Investigators: <u>ZH, AH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>10</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.891014</u>	Long: <u>-155.340088</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Bluejoint Herb (BH)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>1</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>33</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Spiraea stevenii</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u>
2. <u>Betula nana</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Empetrum nigrum</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	FACW species <u>35</u> x2= <u>70</u>
4. <u>Rhododendron tomentosum</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	FAC species <u>75</u> x3= <u>225</u>
5. <u>Salix pulchra</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	FACU species <u>75</u> x4= <u>300</u>
6. <u>Vaccinium uliginosum</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>21</u>				Column Totals: <u>185</u> (A) <u>595</u> (B)
50% of total cover: <u>10.5</u>				<u>Prevalence Index = B/A=</u> <u>3.22</u>
20% of total cover: <u>4.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Dominance Test is >50%
2. <u>Chamaenerion angustifolium</u>	<u>40</u>	<u>Yes</u>	<u>FACU</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>30</u>	<u>No</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Lycopodium annotinum s.l.</u>	<u>20</u>	<u>No</u>	<u>FACU</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Sedum rosea ssp. integrifolium</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Rubus chamaemorus</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Equisetum arvense</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
8. <u>Aconitum delphinifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
9. <u>Carex bigelowii</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u>Arnica sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	
Total Cover: <u>165</u>				Hydrophytic Vegetation Present? Yes <u> </u> No <u> </u> X <u> </u>
50% of total cover: <u>82.5</u>				
20% of total cover: <u>33</u>				
Plot size (radius, or length x width) <u>15 x 40 ft</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes <u>0</u>				
(Where applicable)				
Remarks: <u>Small inclusion of DEST.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4							N/A		hor:Oi
4-7	10YR 2/1	100					No	Silt Loam	hor:A
7-20	7.5YR 2.5/3	100					No	Sandy Loam	hor:A/B 20% cobble

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: WD - Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):	
(includes capillary fringe)	
	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Dry pit. No saturation or water table observed.
Geomorphic Position:



Photo Name: Photo_180721150743



Photo Name: Photo_180721150606



Photo Name: Photo_180721150637

Additional Reference Data: Photos

HDR1216_18



Photo Name: Photo_180721150939



Photo Name: Photo_180721150801



Photo Name: Photo_180721150828

Additional Reference Data: Photos

HDR1216_18



Photo Name: Photo_180721150915

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/21/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1217_18</u>	
Investigators: <u>ZH, AH</u>	Landform (hillslope, terrace, etc.): <u>Valleybottom</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>3</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.894257</u>	Long: <u>-155.344070</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Closed Willow Tall Shrub (CWTS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>2</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>3</u> x2= <u>6</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>131</u> x3= <u>393</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>25</u> x4= <u>100</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>159</u> (A) <u>499</u> (B)
Total Cover: <u>80</u>				<u>Prevalence Index = B/A=</u> <u>3.14</u>
50% of total cover: <u>40</u>				
20% of total cover: <u>16</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Dryopteris expansa</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Angelica lucida</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Mertensia paniculata</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Chamaenerion angustifolium</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sanguisorba canadensis</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Aconitum delphinifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
8. <u>Cornus canadensis</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
9. <u>Geranium erianthum</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
10. <u>Viola sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	
Total Cover: <u>80</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>40</u>				
20% of total cover: <u>16</u>				
Plot size (radius, or length x width) <u>15 x 20 ft</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes <u>10</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-2									hor:Oe
2-20	7.5YR 2.5/2	75					No	Loam	hor:A/B
2-20	7.5YR 2.5/3	25					No	Loam	hor:A/B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: WD - Well Drained					

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	No	X
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):					
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):					
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):					
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary hydro indicators observed. Soil profile dry throughout. No stream running through polygon.

Geomorphic Position: Valley bottom



Photo Name: Photo_180721155853



Photo Name: Photo_180721155725



Photo Name: Photo_180721155822

Additional Reference Data: Photos

HDR1217_18



Photo Name: Photo_180721155940



Photo Name: Photo_180721155925



Photo Name: Photo_180721155910

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/22/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1218_18</u>	
Investigators: <u>ZH AH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>4</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.895508</u>	Long: <u>-155.349274</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Soil Map Unit Name: <u>N/A</u>		NWI Classification: <u>U</u>

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>	Hydric Soil Present? Yes <u> </u> No <u>X</u>
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>80</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>85</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Vaccinium uliginosum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Spiraea stevenii</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	FACW species <u>2</u> x2= <u>4</u>
4. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>176</u> x3= <u>528</u>
5. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>18</u> x4= <u>72</u>
6. <u>Rhododendron tomentosum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	UPL species <u>3</u> x5= <u>15</u>
Total Cover: <u>161</u>				Column Totals: <u>199</u> (A) <u>619</u> (B)
50% of total cover: <u>80.5</u>				Prevalence Index = B/A= <u>3.11</u>
20% of total cover: <u>32.2</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Anemone narcissiflora</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Festuca altaica</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Carex microchaeta</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sedum rosea ssp. integrifolium</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
7. <u>Polygonum bistorta ssp. plumosum</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Artemisia arctica</u>	<u>2</u>	<u>No</u>	<u>NL</u>	must be present, unless disturbed or problematic.
9. <u>Sanguisorba canadensis</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
10. <u>Hierochloe odorata</u>	<u>1</u>	<u>No</u>	<u>NL</u>	
Total Cover: <u>38</u>				
50% of total cover: <u>19</u>				
20% of total cover: <u>7.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks: <u>Lichen 5%</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2							N/A		hor:Oi
2-4							N/A	Organic	hor:Oe
4-20	7.5YR 2.5/3	100					No	Sandy Loam	hor:B/C 15% cobble.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes No X
Type: None.		
Depth (inches):		
Field Drainage Class: WD - Well Drained		

Remarks: No saturation. No water in pit. Alpha alpha negative. Previous 3PP plot determined soil to be hydric due to “small spot tested positive alpha-alpha”. USACE 2007 Regional Supplement states the soil is likely to be hydric if application of alpha alpha to mineral soil material in at least 60% of a layer at least 4” thick within a depth of 12 “ from the soil surface results in a positive reaction within 30 seconds evidenced by pink or red coloration to the dye during the growing season.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes No X
Surface Water Present? Yes No X Depth (inches):		
Water Table Present? Yes No X Depth (inches):		
Saturation Present? Yes No X Depth (inches):		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No saturation. No water in pit.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1218_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<i>Vaccinium vitis-idaea</i>	1	No	FAC
<i>Picea glauca</i>	1	No	FACU
<i>Andromeda polifolia</i>	1	No	FACW

Additional Reference Data: Photos

HDR1218_18



Photo Name: Photo_180721162409

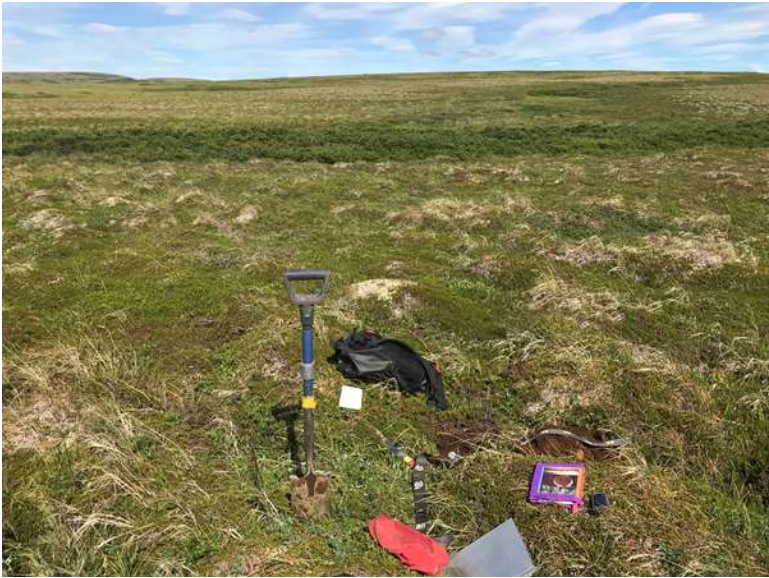


Photo Name: Photo_180721162431

Additional Reference Data: Photos

HDR1218_18



Photo Name: Photo_180721162422

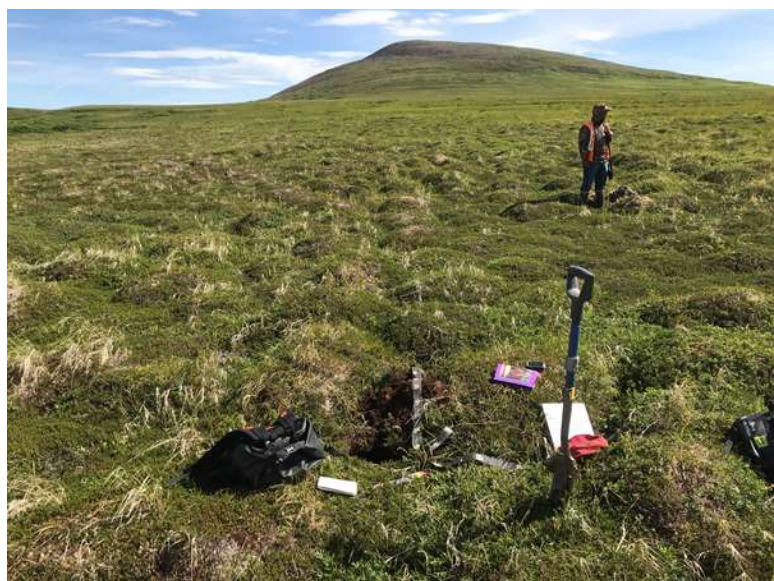


Photo Name: Photo_180721162439



Photo Name: Photo_180721162447



Photo Name: Photo_180721162359

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/22/2018
 Applicant/Owner: PLP Sampling Point: HDR1219_18
 Investigators: ZH, AH Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): Concave Slope(%): 5 HGM: Slope
 Subregion (LRR): X Lat: 59.894531 Long: -155.327423 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/EM1C

Vegetation Type: Open Willow Tall Shrub (OWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Prevalence Index worksheet:				
<u>Sapling/Shrub Stratum</u>		Total % Cover of: <u> </u> Multiply by:		
1. <u>Salix pulchra</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>16</u> x1= <u>16</u>
2. <u>Alnus sinuata</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>12</u> x2= <u>24</u>
3. <u>Salix barclayi</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>137</u> x3= <u>411</u>
4. <u>Spiraea stevenii</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	FACU species <u>4</u> x4= <u>16</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>169</u> (A) <u>467</u> (B)
Total Cover: <u>46</u>				Prevalence Index = B/A= <u>2.76</u>
50% of total cover: <u>23</u>				
20% of total cover: <u>9.2</u>				
Hydrophytic Vegetation Indicators:				
<u>Herb Stratum</u>				X Dominance Test is >50%
1. <u>Calamagrostis canadensis</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	X Prevalence Index is ≤3.0
2. <u>Equisetum arvense</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
3. <u>Comarum palustre</u>	<u>15</u>	<u>No</u>	<u>OBL</u>	data in Remarks or on a separate sheet)
4. <u>Epilobium hornemannii</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
5. <u>Rumex arcticus</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
6. <u>Chamaenerion angustifolium</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
7. <u>Athyrium cyclosorum</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Veratrum viride</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Sanguisorba canadensis</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
10. <u>Senecio triangularis</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>124</u>				
50% of total cover: <u>62</u>				
20% of total cover: <u>24.8</u>				
Plot size (radius, or length x width) <u>20 x 20 ft</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u> </u>				
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-9							N/A		hor:Oe
9-11	7.5YR2/2	100					No	Fine Sandy Loam	hor:A 10% coarse gravel.
11-20	10YR 3/3	90	5YR3/4	10	C	M RC	Yes	Sandy Loam	hor:B/C 20% coarse gravel.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type: None			Yes	<input checked="" type="checkbox"/> X	No
Depth (inches):					
Field Drainage Class: PD - Poorly Drained					

Remarks: H2S@ 6".

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Water Marks (B1)		<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input checked="" type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	2.0	
Water Table Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	6.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	4.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
H2S@6". Surface water in low areas and some overland flow in drainage patterns under willows.

Geomorphic Position: Toeslope.

Additional Reference Data: Overflow Vegetation

HDR1219_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Viola sp.	1	No	N/A
Chrysosplenium tetrandrum	1	No	OBL

Additional Reference Data: Photos

HDR1219_18



Photo Name: Photo_180722090548



Photo Name: Photo_180722090650



Photo Name: Photo_180722090629



Photo Name: Photo_180722090640



Photo Name: Photo_180722090635



Photo Name: Photo_180722090602

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/22/2018
 Applicant/Owner: PLP Sampling Point: HDR1220_18
 Investigators: ZH AH Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 15 HGM: N/A
 Subregion (LRR): X Lat: 59.895714 Long: -155.325348 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Closed Alder Tall Shrub (CATS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u> </u>	No <u>X</u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>1</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>2</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>50</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Alnus sinuata</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u> </u> x2= <u> </u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>90</u> x3= <u>270</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>54</u> x4= <u>216</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>80</u>				Column Totals: <u>144</u> (A) <u>486</u> (B)
50% of total cover: <u>40</u>				Prevalence Index = B/A= <u>3.38</u>
20% of total cover: <u>16</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Dryopteris expansa</u>	<u>50</u>	<u>Yes</u>	<u>FACU</u>	Dominance Test is >50%
2. <u>Equisetum sylvaticum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Cornus canadensis</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Equisetum arvense</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Veratrum viride</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
7. <u>Chamaenerion angustifolium</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>64</u>				
50% of total cover: <u>32</u>				
20% of total cover: <u>12.8</u>				
Plot size (radius, or length x width) <u>10 x 10 ft</u>				
% Bare Ground <u>30</u>				
% Cover of Wetland Bryophytes <u>0</u>				
(Where applicable)				
% Cover of Bryophytes <u>0</u>				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oe
4-18	5YR3/3	100					No	Loam	hor:A/B *2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: WD - Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Remarks: Soil profile dry throughout. No hydric soil indicators observed. *2: 10% gravel and cobble. High amount of cobbles at 18".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
(includes capillary fringe)	
	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydrology indicators observed.

Geomorphic Position:

Additional Reference Data: Photos

HDR1220_18



Photo Name: Photo_180722101007



Photo Name: Photo_180722100923



Photo Name: Photo_180722101043

Additional Reference Data: Photos

HDR1220_18



Photo Name: Photo_180722100823



Photo Name: Photo_180722100856



Photo Name: Photo_180722101051



Photo Name: Photo_180722101033

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	7/22/2018
Applicant/Owner:	PLP			Sampling Point:	HDR1223_18
Investigators:	ZH, AH	Landform (hillslope, terrace, etc.):	Toeslope		
Local Relief (concave, convex, none):	Concave	Slope(%):	2	HGM:	Slope
Subregion (LRR):	X	Lat:	59.900173	Long:	-155.313553
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	PSS1B		

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			

Tree Stratum				Dominance Test Worksheet:			
		Absolute % Cover	Dominant Species?	Indicator Status	Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)		
1.					Total Number of Dominant Species Across All Strata: 3 (B)		
2.					Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)		
3.							
4.							
Total Cover:							
50% of total cover:		0	20% of total cover:		0		
Sapling/Shrub Stratum				Prevalence Index worksheet:			
					Total % Cover of: Multiply by:		
1.	Salix pulchra	80	Yes	FAC	OBL species	15	x1= 15
2.	Ribes sp.	1	No	N/A	FACW species	3	x2= 6
3.					FAC species	115	x3= 345
4.					FACU species	5	x4= 20
5.					UPL species		x5=
6.					Column Totals:	138 (A)	386 (B)
Total Cover:		81			Prevalence Index = B/A= 2.80		
50% of total cover:		40.5	20% of total cover:		16.2		
Herb Stratum				Hydrophytic Vegetation Indicators:			
1.	Calamagrostis canadensis	25	Yes	FAC	X	Dominance Test is >50%	
2.	Comarum palustre	15	Yes	OBL	X	Prevalence Index is ≤3.0	
3.	Equisetum arvense	5	No	FAC	Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet)		
4.	Dryopteris expansa	5	No	FACU	Problematic Hydrophytic Vegetation ¹ (Explain)		
5.	Cornus suecica	3	No	FAC			
6.	Sanguisorba canadensis	3	No	FACW			
7.	Viola sp.	3	No	N/A	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.		
8.	Equisetum sylvaticum	2	No	FAC			
9.							
10.							
Total Cover:		61					
50% of total cover:		30.5	20% of total cover:		12.2		
Plot size (radius, or length x width)		10 x 10 ft	% Bare Ground				
% Cover of Wetland Bryophytes (Where applicable)			% Cover of Bryophytes				
					Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>		

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Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-20							N/A		hor:Oe

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type:	None		Yes	<input checked="" type="checkbox"/> X	No
Depth (inches):					
Field Drainage Class:	PD - Poorly Drained				

Remarks: H2S at 5".

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Water Marks (B1)		<input checked="" type="checkbox"/> X Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> X Geomorphic Position (D2)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input checked="" type="checkbox"/> X FAC-Neutral Test (D5)		

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):		
Water Table Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	5.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	3.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Water slowly weeping into pit at 5" and below = water table.

Geomorphic Position: Toeslope



Photo Name: Photo_180722121720



Photo Name: Photo_180722121748



Photo Name: Photo_180722121754

Additional Reference Data: Photos

HDR1223_18



Photo Name: Photo_180722121729



Photo Name: Photo_180722121801



Photo Name: Photo_180722121738

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/22/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1224_18</u>	
Investigators: <u>ZH AH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>20</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.900177</u>	Long: <u>-155.313477</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Closed Alder Tall Shrub (CATS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: OBL species <u> </u> x1= <u> </u> FACW species <u> </u> x2= <u> </u> FAC species <u>84</u> x3= <u>252</u> FACU species <u>48</u> x4= <u>192</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>132</u> (A) <u>444</u> (B) Prevalence Index = B/A= <u>3.36</u>
Sapling/Shrub Stratum				
1. <u>Alnus sinuata</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>80</u>				
50% of total cover: <u>40</u>		20% of total cover: <u>16</u>		
Herb Stratum				Hydrophytic Vegetation Indicators: Dominance Test is >50% Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u>
1. <u>Dryopteris expansa</u>	<u>40</u>	<u>Yes</u>	<u>FACU</u>	
2. <u>Gymnocarpium dryopteris</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
3. <u>Calamagrostis canadensis</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
4. <u>Chamaenerion angustifolium</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
5. <u>Equisetum arvense</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>52</u>				
50% of total cover: <u>26</u>		20% of total cover: <u>10.4</u>		
Plot size (radius, or length x width) <u>20 x 20 ft</u> % Bare Ground <u> </u> % Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u> (Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-6									hor:Oe
6-12	7.5YR 2.5/2	100					No	Loam	hor:A
12-21	10YR 3/3	100					No	Sandy Loam	hor:B 15% medium gravel

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: WD - Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches):	
(includes capillary fringe)	
	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydro indicators observed.

Geomorphic Position:

Additional Reference Data: Photos

HDR1224_18



Photo Name: Photo_180722125630



Photo Name: Photo_180722125511



Photo Name: Photo_180722125555

Additional Reference Data: Photos

HDR1224_18



Photo Name: Photo_180722125456



Photo Name: Photo_180722125717



Photo Name: Photo_180722125652

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/22/2018
 Applicant/Owner: PLP Sampling Point: HDR1227_18
 Investigators: ZH, AH Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 5 HGM: N/A
 Subregion (LRR): X Lat: 59.899319 Long: -155.307175 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Closed Alder Tall Shrub (CATS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:	
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>2</u> (B)	
Total Cover: <u> </u>				Percent of Dominant Species	
50% of total cover: <u>0</u>			20% of total cover: <u>0</u>	That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
Sapling/Shrub Stratum				Prevalence Index worksheet:	
1. <u>Alnus sinuata</u>	85	Yes	FAC	Total % Cover of: <u> </u> Multiply by:	
2. <u>Ribes sp.</u>	1	No	N/A	OBL species <u> </u> x1= <u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u> </u> x2= <u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>135</u> x3= <u>405</u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>13</u> x4= <u>52</u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>	
Total Cover: <u>86</u>				Column Totals: <u>148</u> (A) <u>457</u> (B)	
50% of total cover: <u>43</u>			20% of total cover: <u>17.2</u>	$Prevalence\ Index = B/A = 3.09$	
Herb Stratum				Hydrophytic Vegetation Indicators:	
1. <u>Calamagrostis canadensis</u>	40	Yes	FAC	X Dominance Test is >50%	
2. <u>Dryopteris expansa</u>	10	No	FACU	Prevalence Index is ≤3.0	
3. <u>Equisetum sylvaticum</u>	5	No	FAC	Morphological Adaptations ¹ (Provide	
4. <u>Cornus suecica</u>	3	No	FAC	data in Remarks or on a separate sheet)	
5. <u>Thelypteris phegopteris</u>	3	No	FACU	Problematic Hydrophytic Vegetation ¹ (Explain)	
6. <u>Carex bigelowii</u>	2	No	FAC		
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
Total Cover: <u>63</u>				Hydrophytic Vegetation Present?	
50% of total cover: <u>31.5</u>			20% of total cover: <u>12.6</u>		
Plot size (radius, or length x width) <u>20 x 20 ft</u>			% Bare Ground <u> </u>		
% Cover of Wetland Bryophytes <u> </u>			% Cover of Bryophytes <u> </u>		
(Where applicable)					
Remarks: <u> </u>					

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1							N/A		hor:Oi
1-3	7.5YR 2.5/2	100					No	Silt Loam	hor:A
3-20	7.5YR 3/3	100					No	Loam	hor:B/C 40% coarse gravel.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: WD - Well Drained					

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	No	X
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydro indicators observed.

Geomorphic Position:

Additional Reference Data: Photos

HDR1227_18



Photo Name: Photo_180722142539



Photo Name: Photo_180722142505



Photo Name: Photo_180722142519

Additional Reference Data: Photos

HDR1227_18



Photo Name: Photo_180722142548



Photo Name: Photo_180722142531



Photo Name: Photo_180722142512

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/22/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1228_18</u>	
Investigators: <u>ZH AH</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>2</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.899601</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1/EM1C</u>	

Vegetation Type: Open Willow Tall Shrub (OWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>65</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u>
2. <u>Spiraea stevenii</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>1</u> x2= <u>2</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>126</u> x3= <u>378</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>20</u> x4= <u>80</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>75</u>				Column Totals: <u>147</u> (A) <u>460</u> (B)
50% of total cover: <u>37.5</u>				<u>Prevalence Index = B/A=</u> <u>3.13</u>
20% of total cover: <u>15</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum sylvaticum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Cornus canadensis</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Dryopteris expansa</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Athyrium cyclosorum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Equisetum arvense</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Pyrola minor</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
8. <u>Sanguisorba canadensis</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
9. <u>Viola sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>73</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>36.5</u>				
20% of total cover: <u>14.6</u>				
Plot size (radius, or length x width) <u>10 x 10 ft</u>				
% Cover of Wetland Bryophytes <u>30</u>				
% Cover of Bryophytes <u>40</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-11									hor:Oe
11-16	10YR2/2	100						Sandy Loam	hor:A *3

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: None		
Depth (inches):		
Field Drainage Class: PD - Poorly Drained		

Remarks: H2S at 6". *3: 80% cobbles and gravels. High amounts of cobble gravel at 16".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 2.0		
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 1.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Surface water in low areas, some overland flow in drainage patterns.

Geomorphic Position: Toeslope



Photo Name: Photo_180722150419



Photo Name: Photo_180722150339



Photo Name: Photo_180722150439



Photo Name: Photo_180722150407



Photo Name: Photo_180722150256



Photo Name: Photo_180722150454



Photo Name: Photo_180722150325

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/22/2018
 Applicant/Owner: PLP Sampling Point: HDR1230_18
 Investigators: ZH AH Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): None Slope(%): 3 HGM: N/A
 Subregion (LRR): X Lat: 59.898205 Long: -155.306488 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Alder Tall Shrub (OATS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover:	<u> </u>			
50% of total cover:	<u>0</u>	20% of total cover:	<u>0</u>	Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: OBL species <u> </u> x1= <u> </u> FACW species <u> </u> x2= <u> </u> FAC species <u>119</u> x3= <u>357</u> FACU species <u>25</u> x4= <u>100</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>144</u> (A) <u>457</u> (B) Prevalence Index = B/A= <u>3.17</u>
Sapling/Shrub Stratum				
1. <u>Alnus sinuata</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Ribes sp.</u>	<u>5</u>	<u>No</u>	<u>N/A</u>	
3. <u>Salix pulchra</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover:	<u>31</u>			
50% of total cover:	<u>15.5</u>	20% of total cover:	<u>6.2</u>	
Herb Stratum				Hydrophytic Vegetation Indicators: X Dominance Test is >50% Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
1. <u>Calamagrostis canadensis</u>	<u>90</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Thelypteris phegopteris</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	
3. <u>Dryopteris expansa</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
4. <u>Gymnocarpium dryopteris</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
5. <u>Streptopus amplexifolius</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
6. <u>Cornus suecica</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover:	<u>118</u>			
50% of total cover:	<u>59</u>	20% of total cover:	<u>23.6</u>	
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u> % Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u> (Where applicable)				
Remarks: <u>Several standing dead alders.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-3									hor:Oe
3-20	7.5YR 2.5/3	100					No		hor:A/B 10% cobbles

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: WD - Well Drained					

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	No	X
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):					
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):					
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):					
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary hydro indicators observed.

Geomorphic Position: Toeslope

Additional Reference Data: Photos

HDR1230_18



Photo Name: Photo_180722155236



Photo Name: Photo_180722155227



Photo Name: Photo_180722155217



Photo Name: Photo_180722155210



Photo Name: Photo_180722155231



Photo Name: Photo_180722155223

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/23/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1231_18</u>	
Investigators: <u>ZH AH</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>3</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.898575</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1/EM1B</u>	

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil X or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				
50% of total cover: <u>0</u>				20% of total cover: <u>0</u>
Sapling/Shrub Stratum				
1. <u>Salix pulchra</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: OBL species <u> </u> x1= <u> </u> FACW species <u>5</u> x2= <u>10</u> FAC species <u>126</u> x3= <u>378</u> FACU species <u>12</u> x4= <u>48</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>143</u> (A) <u>436</u> (B) Prevalence Index = B/A= <u>3.05</u>
2. <u>Spiraea stevenii</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>63</u>				
50% of total cover: <u>31.5</u>				20% of total cover: <u>12.6</u>
Herb Stratum				
1. <u>Calamagrostis canadensis</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: X Dominance Test is >50% Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Equisetum sylvaticum</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	
3. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
4. <u>Chamaenerion angustifolium</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
5. <u>Dryopteris expansa</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
6. <u>Gymnocarpium dryopteris</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
7. <u>Cornus suecica</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
8. <u>Viola sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>81</u>				
50% of total cover: <u>40.5</u>				20% of total cover: <u>16.2</u>
Plot size (radius, or length x width) <u>10 x 10 ft</u>				% Bare Ground <u>0</u>
% Cover of Wetland Bryophytes <u>0</u>		% Cover of Bryophytes <u>0</u>		
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-3									hor:Oe
3-5									hor:Oa
5-8	10YR 2/2	40	2.5YR 2.5/4	5	C	PL	No	Loam	hor:A *4
5-8	2.5Y 3/2	35	5YR 4/6	20	C	M	No	Loam	hor:A *5
8-16	10YR3/2	85	5YR 5/6	15	C	M	No	Fine Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:

<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input checked="" type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: SPD - Somewhat Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
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Remarks: *4: Organic fibers and staining common in horizon. *5: Organic fibers and staining common in horizon.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): 2.0 Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): 12.0 Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): 8.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
2" inundation located in low area in downslope portion of plot. Stream running through poly.

Geomorphic Position: Toeslope

Additional Reference Data: Photos

HDR1231_18



Photo Name: Photo_180722162553



Photo Name: Photo_180722162610



Photo Name: Photo_180722162550

Additional Reference Data: Photos

HDR1231_18



Photo Name: Photo_180722162558



Photo Name: Photo_180722162606



Photo Name: Photo_180722162540

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/23/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1232_18</u>	
Investigators: <u>ZH AH</u>	Landform (hillslope, terrace, etc.): <u>Bench</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>5</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.910633</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS3/USC</u>	

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix pulchra</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACW species <u>6</u> x2= <u>12</u>
4. <u>Rhododendron tomentosum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FAC species <u>161</u> x3= <u>483</u>
5. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>4</u> x4= <u>16</u>
6. <u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	UPL species <u>1</u> x5= <u>5</u>
Total Cover: <u>108</u>				Column Totals: <u>172</u> (A) <u>516</u> (B)
50% of total cover: <u>54</u>				<u>Prevalence Index = B/A=</u> <u>3.00</u>
20% of total cover: <u>21.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Carex macrochaeta</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Cornus suecica</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sedum rosea ssp. integrifolium</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
7. <u>Dryopteris expansa</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Pedicularis labradorica</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	must be present, unless disturbed or problematic.
9. <u>Arnica sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	
10. <u>Artemisia arctica</u>	<u>1</u>	<u>No</u>	<u>NL</u>	
Total Cover: <u>65</u>				
50% of total cover: <u>32.5</u>				
20% of total cover: <u>13</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u>5</u> % Cover of Bryophytes ⁵ <u> </u>				
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-5									hor:Oe
5-7									hor:Oa
7-15	7.5YR 2.5/2	100					No	Loam	hor:A 50% coarse gravel and cobble.
15-20	10YR 3/3	100					No	Sandy Loam	hor:B 50% coarse gravel and cobble.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):					
Type:					
Depth (inches):	N/A				
Field Drainage Class:	SPD - Somewhat Poorly Drained				
			Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks: H2S at 8 inches. Close to Histic epipedon. High organic content in A horizon but determined to be mineral soil.

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)					
<input checked="" type="checkbox"/> Surface Water (A1)		<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input type="checkbox"/> Water Marks (B1)		<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input checked="" type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input type="checkbox"/> Microtopographic Relief (D4)		
			<input type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations:					
Surface Water Present?	Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	5.0	
Water Table Present?	Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	5.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	4.0	
(includes capillary fringe)					
			Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Inundation in bottoms of hummocks. Strong H2S in hummock bottoms covered with sphagnum.

Geomorphic Position: Bench

Additional Reference Data: Overflow Vegetation

HDR1232_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Spiraea stevenii</u>	<u>3</u>	<u>No</u>	<u>FACU</u>

Additional Reference Data: Photos

HDR1232_18



Photo Name: Photo_180723092946



Photo Name: Photo_180723093047



Photo Name: Photo_180723093009



Photo Name: Photo_180723092905



Photo Name: Photo_180723093026



Photo Name: Photo_180723092856

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/23/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1233_18</u>	
Investigators: <u>ZH, AH</u>	Landform (hillslope, terrace, etc.): <u>Terrace</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>10</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.910526</u>	Long: <u>-155.333237</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	

Remarks: Still on terrace tread but just above the convex rollover/riser. Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Empetrum nigrum</u>	70	Yes	FAC	OBL species <u> </u> x1= <u> </u>
2. <u>Vaccinium uliginosum</u>	10	No	FAC	FACW species <u> </u> x2= <u> </u>
3. <u>Betula nana</u>	5	No	FAC	FAC species <u>153</u> x3= <u>459</u>
4. <u>Rhododendron tomentosum</u>	5	No	FAC	FACU species <u>5</u> x4= <u>20</u>
5. <u>Salix pulchra</u>	5	No	FAC	UPL species <u>3</u> x5= <u>15</u>
6. <u>Spiraea stevenii</u>	5	No	FACU	Column Totals: <u>161</u> (A) <u>494</u> (B)
Total Cover: <u>103</u>				Prevalence Index = B/A= <u>3.07</u>
50% of total cover: <u>51.5</u>				
20% of total cover: <u>20.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	20	Yes	FAC	<u>X</u> Dominance Test is >50%
2. <u>Carex microchaeta</u>	20	Yes	FAC	Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	10	No	FAC	Morphological Adaptations ¹ (Provide
4. <u>Sedum rosea ssp. integrifolium</u>	5	No	FAC	data in Remarks or on a separate sheet)
5. <u>Arnica sp.</u>	3	No	N/A	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Artemisia arctica</u>	3	No	NL	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>61</u>				
50% of total cover: <u>30.5</u>				
20% of total cover: <u>12.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u> </u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes ⁵ <u> </u>				Present?
(Where applicable)				

Remarks:
High carex component. Hummocky.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2							N/A		hor:Oi
2-4							N/A		hor:Oe
4-5							N/A		hor:Oa
5-8	7.5YR 3/3	100					No	Sandy Loam	hor:A/B Gravelly
8-19	10YR 4/4	100					No	Sandy Loam	hor:B/C Gravelly

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: MWD - Moderately Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Saturation Present? Yes <input checked="" type="checkbox"/> X No <input type="checkbox"/> Depth (inches): 17.0	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Not saturated in upper 12" of the soil profile. No hydrology indicators observed.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1233_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<i>Vaccinium vitis-idaea</i>	3	No	FAC

Additional Reference Data: Photos

HDR1233_18



Photo Name: Photo_180723101820



Photo Name: Photo_180723101702



Photo Name: Photo_180723101655



Photo Name: Photo_180723101737



Photo Name: Photo_180723101802



Photo Name: Photo_180723101721



Photo Name: Photo_180723101621

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/23/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1234_18</u>	
Investigators: <u>ZH, AH</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>10</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.910160</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Vaccinium uliginosum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>20</u> x2= <u>40</u>
3. <u>Empetrum nigrum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FAC species <u>81</u> x3= <u>243</u>
4. <u>Spiraea stevenii</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	FACU species <u>11</u> x4= <u>44</u>
5. <u>Betula nana</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>112</u> (A) <u>327</u> (B)
Total Cover: <u>53</u>				<u>Prevalence Index = B/A=</u> <u>2.92</u>
50% of total cover: <u>26.5</u>				Hydrophytic Vegetation Indicators:
20% of total cover: <u>10.6</u>				<u>X</u> Dominance Test is >50%
<u>Herb Stratum</u>				<u>X</u> Prevalence Index is ≤3.0
1. <u>Sanguisorba canadensis</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
2. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
3. <u>Chamaenerion angustifolium</u>	<u>7</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
4. <u>Carex podocarpa</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
5. <u>Rubus arcticus s.l.</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
6. <u>Sedum rosea ssp. integrifolium</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
7. <u>Cornus suecica</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
8. <u>Equisetum arvense</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
9. <u>Dryopteris expansa</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>59</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>29.5</u>				
20% of total cover: <u>11.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes ⁵ <u> </u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1							N/A		hor:Oi
1-9							N/A		hor:Oe
9-19	10YR3/2	100					No	Loam	hor:A/B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: None.		
Depth (inches):		
Field Drainage Class: SPD - Somewhat Poorly Drained		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 3.0		
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 8.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 5.0		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water in low areas.

Geomorphic Position: Toeslope.



Photo Name: Photo_180723114856

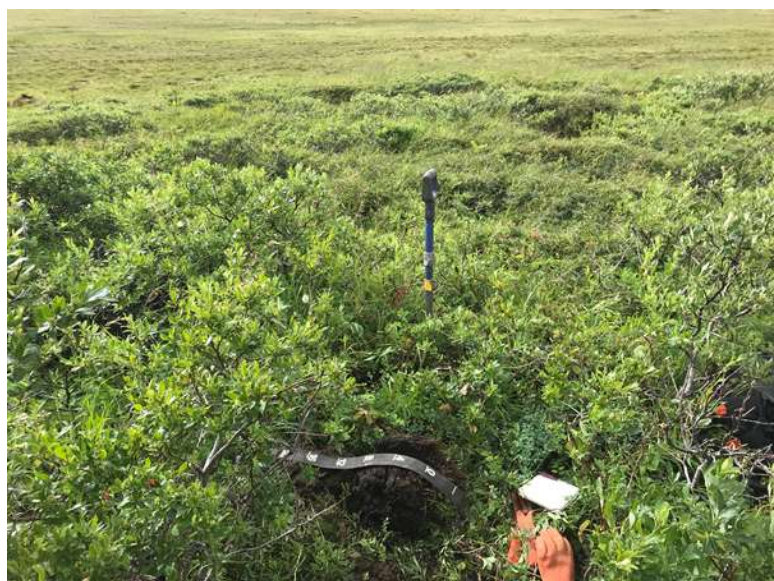


Photo Name: Photo_180723114840



Photo Name: Photo_180723114908

Additional Reference Data: Photos

HDR1234_18



Photo Name: Photo_180723114810



Photo Name: Photo_180723114817



Photo Name: Photo_180723114830

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/23/2018
 Applicant/Owner: PLP Sampling Point: HDR1235_18
 Investigators: ZH AH Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): None Slope(%): 8 HGM: Slope
 Subregion (LRR): X Lat: 59.910240 Long: -155.325516 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/3C

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Prevalence Index worksheet:				
<u>Sapling/Shrub Stratum</u>		Total % Cover of: <u> </u> Multiply by:		
1. <u>Salix pulchra</u>	<u>55</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Empetrum nigrum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>1</u> x2= <u>2</u>
3. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>146</u> x3= <u>438</u>
4. <u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	FACU species <u>12</u> x4= <u>48</u>
5. <u>Vaccinium uliginosum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
6. <u>Vaccinium vitis-idaea</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	Column Totals: <u>159</u> (A) <u>488</u> (B)
Total Cover: <u>121</u>				
50% of total cover: <u>60.5</u>				Prevalence Index = B/A= <u>3.07</u>
20% of total cover: <u>24.2</u>				
Hydrophytic Vegetation Indicators:				
<u>Herb Stratum</u>				X Dominance Test is >50%
1. <u>Carex bigelowii</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
2. <u>Rubus stellatus</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
3. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
4. <u>Geranium erianthum</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
5. <u>Sedum rosea ssp. integrifolium</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
6. <u>Aconitum delphiniiifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
7. <u>Cornus suecica</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
8. <u>Angelica lucida</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
9. <u>Chamaenerion angustifolium</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
10. <u>Sanguisorba canadensis</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>39</u>				
50% of total cover: <u>19.5</u>				
20% of total cover: <u>7.8</u>				
Plot size (radius, or length x width) <u>10 x 20 ft</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u> </u>		% Cover of Bryophytes <u> </u>		
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Type: None

Depth (inches): _____

Field Drainage Class: SPD - Somewhat Poorly Drained

Hydric Soil Present? Yes X No

Remarks: Would meet 2.5Y hue indicator but not problematic due to H2S. *2: High organic fibers and staining. *3: High organic fibers and staining.

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

<input checked="" type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Algal Mat or Crust (B4)	
<input type="checkbox"/> Iron Deposits (B5)	
<input type="checkbox"/> Surface Soil Cracks (B6)	

Secondary Indicators (2 or more required)

<input type="checkbox"/>	Water-stained Leaves (B9)
<input type="checkbox"/>	Drainage Patterns (B10)
<input type="checkbox"/>	Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/>	Presence of Reduced Iron (C4)
<input type="checkbox"/>	Salt Deposits (C5)
<input type="checkbox"/>	Stunted or Stressed Plants (D1)
<input checked="" type="checkbox"/>	Geomorphic Position (D2)
<input type="checkbox"/>	Shallow Aquitard (D3)
<input type="checkbox"/>	Microtopographic Relief (D4)
<input type="checkbox"/>	FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	<u>X</u>	No	_____	Depth (inches):	<u>3.0</u>
Water Table Present?	Yes	<u>X</u>	No	_____	Depth (inches):	<u>0.0</u>
Saturation Present?	Yes	<u>X</u>	No	_____	Depth (inches):	<u>0.0</u>
(includes capillary fringe)						

Wetland Hydrology Present?	Yes	X	No
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water present in low areas. Narrow groundwater discharge zone at toe of slope.

Geomorphic Position: Toeslope.

Additional Reference Data: Overflow Vegetation

HDR1235_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Anemone sp.	1	No	N/A

Additional Reference Data: Photos

HDR1235_18



Photo Name: Photo_180723134024

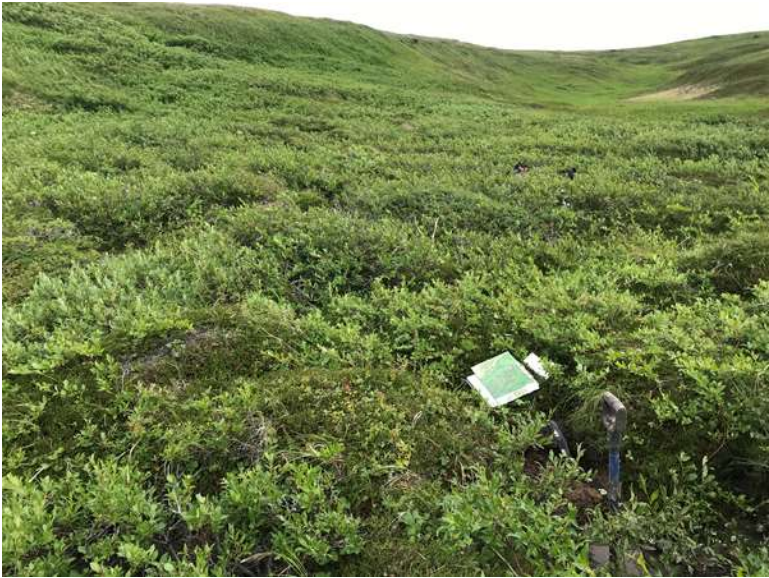


Photo Name: Photo_180723134104



Photo Name: Photo_180723134122



Photo Name: Photo_180723134032



Photo Name: Photo_180723134132



Photo Name: Photo_180723134114

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/23/2018
 Applicant/Owner: PLP Sampling Point: HDR1236_18
 Investigators: ZH AH Landform (hillslope, terrace, etc.): Valleybottom
 Local Relief (concave, convex, none): None Slope(%): 4 HGM: N/A
 Subregion (LRR): X Lat: 59.910130 Long: -155.325439 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Closed Willow Low Shrub (CWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>75</u> (A/B)
20% of total cover: <u>0</u>				
Prevalence Index worksheet:				
Total % Cover of:		Multiply by:		
OBL species	<u> </u>	x1=	<u> </u>	
FACW species	<u>3</u>	x2=	<u>6</u>	
FAC species	<u>101</u>	x3=	<u>303</u>	
FACU species	<u>24</u>	x4=	<u>96</u>	
UPL species	<u> </u>	x5=	<u> </u>	
Column Totals:	<u>128</u> (A)		<u>405</u> (B)	
Prevalence Index = B/A=				<u>3.16</u>
Hydrophytic Vegetation Indicators:				
X Dominance Test is >50%				
Prevalence Index is ≤3.0				
Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet)				
Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>				

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Salix pulchra</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Spiraea stevenii</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	
3. <u>Vaccinium vitis-idaea</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>91</u>				
50% of total cover: <u>45.5</u>				
20% of total cover: <u>18.2</u>				
Herb Stratum				
1. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Rubus stellatus</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Pyrola asarifolia</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	
4. <u>Chamaenerion angustifolium</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
5. <u>Sanguisorba canadensis</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	
6. <u>Geranium erianthum</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
7. <u>Viola sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>38</u>				
50% of total cover: <u>19</u>				
20% of total cover: <u>7.6</u>				
Plot size (radius, or length x width) <u>10 x 10 ft</u>				% Bare Ground <u>0</u>
% Cover of Wetland Bryophytes <u> </u>		% Cover of Bryophytes ⁵ <u> </u>		
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-6									hor:Oe
6-7									hor:Oa
7-20	7.5YR 2.5/2	100					No	Loam	hor:A/B *4

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: MWD - Moderately Well Drained	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X

Remarks: No hydric soil indicators observed. No saturation. Dense deciduous shrubs and presence of herbaceous species could contribute to organic build up.
⁴4: Organic staining in mineral layer.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary hydro indicators observed.

Geomorphic Position: Valley bottom.

Additional Reference Data: Photos

HDR1236_18



Photo Name: Photo_180723141523



Photo Name: Photo_180723141515



Photo Name: Photo_180723141631



Photo Name: Photo_180723141610



Photo Name: Photo_180723141604



Photo Name: Photo_180723141559

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/23/2018
 Applicant/Owner: PLP Sampling Point: HDR1239_18
 Investigators: ZH AH Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 2 HGM: N/A
 Subregion (LRR): X Lat: 59.905941 Long: -155.327377 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Bluejoint Herb (BH)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet: <u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u> OBL species <u> </u> x1= <u> </u> FACW species <u>19</u> x2= <u>38</u> FAC species <u>73</u> x3= <u>219</u> FACU species <u>13</u> x4= <u>52</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>105</u> (A) <u>309</u> (B) <i>Prevalence Index = B/A=</i> <u>2.94</u>
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators: X Dominance Test is >50% X Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Calamagrostis canadensis</u>	60	Yes	FAC	
2. <u>Sanguisorba canadensis</u>	15	No	FACW	
3. <u>Chamaenerion angustifolium</u>	10	No	FACU	
4. <u>Athyrium cyclosorum</u>	5	No	FAC	
5. <u>Rubus stellatus</u>	3	No	FAC	
6. <u>Salix pulchra</u>	3	No	FAC	
7. <u>Viola langsdorffii</u>	3	No	FACW	
8. <u>Carex bigelowii</u>	1	No	FAC	
9. <u>Cornus suecica</u>	1	No	FAC	
10. <u>Phleum alpinum</u>	1	No	FACU	
Total Cover: <u>105</u>				
50% of total cover: <u>52.5</u>		20% of total cover: <u>21</u>		
Plot size (radius, or length x width) <u>10 x 20 ft</u>		% Bare Ground <u>10</u>		
% Cover of Wetland Bryophytes <u> </u>		% Cover of Bryophytes <u> </u>		
(Where applicable)				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
Remarks: <u>Spi ste and Sal pul added to herb stratum because shrub stratum had <5% cover.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-19	10YR 4/3	100					No	Silt Loam	hor:A *1

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches):	
Field Drainage Class: WD - Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X

Remarks: No hydric soil indicators observed. *1: Organic fibers common. 3% course rounded gravels. Cobbles prevalent at 19".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
(includes capillary fringe)	
	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Soil profile moist but not saturated. No primary hydro indicators observed.

Geomorphic Position: Depressional area.

Additional Reference Data: Overflow Vegetation

HDR1239_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Spiraea stevenii	1	No	FACU
Trientalis europaea	1	No	FACU
Carex canescens	1	No	FACW

Additional Reference Data: Photos

HDR1239_18



Photo Name: Photo_180723154431



Photo Name: Photo_180723154356



Photo Name: Photo_180723154420



Photo Name: Photo_180723154405



Photo Name: Photo_180723154322



Photo Name: Photo_180723154332

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/24/2018
 Applicant/Owner: PLP Sampling Point: HDR1241_18
 Investigators: ZH, AH Landform (hillslope, terrace, etc.): Footslope
 Local Relief (concave, convex, none): Concave Slope(%): 6 HGM: N/A
 Subregion (LRR): X Lat: 59.891277 Long: -155.271103 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Willow Tall Shrub (OWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>2</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Spiraea stevenii</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>15</u> x2= <u>30</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>170</u> x3= <u>510</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>32</u> x4= <u>128</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>73</u>				Column Totals: <u>217</u> (A) <u>668</u> (B)
50% of total cover: <u>36.5</u>				Prevalence Index = B/A= <u>3.08</u>
20% of total cover: <u>14.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Chamaenerion angustifolium</u>	<u>20</u>	<u>No</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>15</u>	<u>No</u>	<u>FACW</u>	Morphological Adaptations ¹ (Provide
4. <u>Veratrum viride</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Equisetum sylvaticum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Pyrola asarifolia</u>	<u>4</u>	<u>No</u>	<u>FACU</u>	
7. <u>Aconitum delphinifolium</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Rubus stellatus</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
10. <u>Geranium erianthum</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>144</u>				
50% of total cover: <u>72</u>				
20% of total cover: <u>28.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1							N/A		hor:Oe
1-8	7.5YR 2.5/1	100					No	Very Fine Sandy	hor:A
8-20	7.5YR3/3	100					No	Very Fine Sandy	hor:B 10% medium gravel.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: <input type="checkbox"/> None Depth (inches): _____ Field Drainage Class: <input type="checkbox"/> WD - Well Drained	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>
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Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Soil profile moist but not saturated. No primary hydrology indicators observed.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1241_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Achillea millefolium s.l.	2	No	FACU
Cornus suecica	1	No	FAC

Additional Reference Data: Photos

HDR1241_18



Photo Name: Photo_180724085300



Photo Name: Photo_180724085322

Additional Reference Data: Photos

HDR1241_18



Photo Name: Photo_180724085204



Photo Name: Photo_180724085309



Photo Name: Photo_180724085250



Photo Name: Photo_180724085152

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/24/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1243_18</u>	
Investigators: <u>ZH AH</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>5</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.892399</u>	Long: <u>-155.274643</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Shrub Birch – Willow (SBW)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>6</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>83</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Betula glandulosa</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u>
2. <u>Empetrum nigrum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix pulchra</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>8</u> x2= <u>16</u>
4. <u>Vaccinium uliginosum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FAC species <u>108</u> x3= <u>324</u>
5. <u>Spiraea stevenii</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	FACU species <u>45</u> x4= <u>180</u>
6. <u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>98</u>				Column Totals: <u>161</u> (A) <u>520</u> (B)
50% of total cover: <u>49</u>				<u>Prevalence Index = B/A=</u> <u>3.23</u>
20% of total cover: <u>19.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Chamaenerion angustifolium</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>7</u>	<u>Yes</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Geranium erianthum</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Pyrola asarifolia</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Aconitum delphinifolium</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Carex bigelowii</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
8. <u>Sedum rosea ssp. integrifolium</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
9. <u>Cornus canadensis</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
10. <u>Viola sp.</u>	<u>3</u>	<u>No</u>	<u>N/A</u>	
Total Cover: <u>66</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>33</u>				
20% of total cover: <u>13.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u> </u>		% Cover of Bryophytes <u> </u>		
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-3									hor:Oe
3-9	7.5YR 2.5/2	100					No	Very Fine Sandy	hor:A
9-13	2.5Y 3/2	85	5YR 4/4	15	C	M	No	Very Fine Sandy	hor:B1
13-21	10YR 5/3	85	7.5YR 5/6	15	C	M	No	Fine Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present):	
Type: <input type="checkbox"/> None	
Depth (inches):	
Field Drainage Class: <input type="checkbox"/> SPD - Somewhat Poorly Drained	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>

Remarks: 2.5Y hue with appropriate redox but no primary hydro indicator.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches):	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Soil profile moist but not saturated. No primary hydrology indicators.

Geomorphic Position: Toeslope

Additional Reference Data: Overflow Vegetation

HDR1243_18

	Absolute % Cover	Dominant Species?	Indicator Status
Herb			
Polemonium acutiflorum	1	No	FAC
Dryopteris expansa	1	No	FACU
Moehringia lateriflora	1	No	FACU
Rubus chamaemorus	1	No	FACW
Sapling/Shrub			
Betula nana	3	No	FAC

Additional Reference Data: Photos

HDR1243_18



Photo Name: Photo_180724104259



Photo Name: Photo_180724104353



Photo Name: Photo_180724104150



Photo Name: Photo_180724104244



Photo Name: Photo_180724104137



Photo Name: Photo_180724104218



Photo Name: Photo_180724104323

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/24/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1245_18</u>	
Investigators: <u>ZH, AH</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>2</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.892574</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>U</u>	

Vegetation Type: Bluejoint Herb (BH)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Betula glandulosa</u>	<u>2</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Salix pulchra</u>	<u>2</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>10</u> x2= <u>20</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>107</u> x3= <u>321</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>40</u> x4= <u>160</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>157</u> (A) <u>501</u> (B)
Total Cover: <u>4</u>				<u>Prevalence Index = B/A=</u> <u>3.19</u>
50% of total cover: <u>2</u>				
20% of total cover: <u>0.8</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Chamaenerion angustifolium</u>	<u>30</u>	<u>No</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Festuca altaica</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Rubus stellatus</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Moehringia lateriflora</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
7. <u>Geranium erianthum</u>	<u>4</u>	<u>No</u>	<u>FACU</u>	
8. <u>Aconitum delphinifolium</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
9. <u>Senecio sp.</u>	<u>2</u>	<u>No</u>	<u>NULL</u>	
10. <u>Achillea millefolium s.l.</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>156</u>				
50% of total cover: <u>78</u>				
20% of total cover: <u>31.2</u>				
Plot size (radius, or length x width) <u>20 x 20 ft</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u> </u>		% Cover of Bryophytes <u>10</u>		
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1							N/A		hor:Oi
1-2							N/A		hor:Oe
2-7	7.5YR2.5/1	85	5YR3/3	15	C	M	No	Silt Loam	hor:A High organic content in A.
7-16	7.5YR4/4	90	7.5YR3/3	10	C	M	No	Sandy Loam	hor:B1
16-20	2.5Y4/2	80	5YR3/2	10	C	M	No	Sandy Loam	hor:B2
16-20			5YR4/4	10	C	M	No	Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:
☐ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:
☐ Alaska Color Change (TA4)⁴
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox With 2.5Y Hue

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

☐ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
☐ Other (Explain in Remarks)

Restrictive Layer (if present):
Type:
Depth (inches):
Field Drainage Class:

Hydric Soil Present? Yes ☐ No ☐ X ☒

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)
☐ Surface Water (A1)
☐ High Water Table (A2)
☐ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Marl Deposits (B15)
☐ Hydrogen Sulfide Odor (C1)
☐ Dry Season Water Table (C2)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)
☐ Water-stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☒ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ Microtopographic Relief (D4)
☐ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ☐ No ☐ X ☒ Depth (inches):
Water Table Present? Yes ☐ No ☐ X ☒ Depth (inches):
Saturation Present? Yes ☒ No ☐ X ☐ Depth (inches):
(includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☐ X ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No saturation in upper 12" of soil profile. No primary hydrology indicators observed. Plot is located approximately 3 feet higher than pond to the north.

Geomorphic Position: Toeslope.

Additional Reference Data: Overflow Vegetation

HDR1245_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Viola sp.	1	No	N/A

Additional Reference Data: Photos

HDR1245_18



Photo Name: Photo_180724113344



Photo Name: Photo_180724113413



Photo Name: Photo_180724113424



Photo Name: Photo_180724113357



Photo Name: Photo_180724113325



Photo Name: Photo_180724113438

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/24/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1246_18</u>	
Investigators: <u>ZH, AH</u>	Landform (hillslope, terrace, etc.): <u>Swale</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>0</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.894726</u>	Long: <u>-155.283325</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet: <u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u> OBL species <u> </u> x1= <u> </u> FACW species <u>25</u> x2= <u>50</u> FAC species <u>74</u> x3= <u>222</u> FACU species <u>5</u> x4= <u>20</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>104</u> (A) <u>292</u> (B) <i>Prevalence Index = B/A=</i> <u>2.81</u>
1. <u>Empetrum nigrum</u>	50	Yes	FAC	
2. <u>Betula nana</u>	10	No	FAC	
3. <u>Spiraea stevenii</u>	5	No	FACU	
4. <u>Vaccinium uliginosum</u>	3	No	FAC	
5. <u>Vaccinium vitis-idaea</u>	3	No	FAC	
6. <u>Rhododendron tomentosum</u>	1	No	FAC	
Total Cover: <u>73</u>				
50% of total cover: <u>36.5</u>		20% of total cover: <u>14.6</u>		
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators: X Dominance Test is >50% X Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Carex stylosa</u>	25	Yes	FACW	
2. <u>Calamagrostis canadensis</u>	5	No	FAC	
3. <u>Rubus stellatus</u>	1	No	FAC	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>31</u>				
50% of total cover: <u>15.5</u>		20% of total cover: <u>6.2</u>		
Plot size (radius, or length x width) <u>10 x 10 ft</u>		% Bare Ground <u>5</u>		
% Cover of Wetland Bryophytes <u> </u>		% Cover of Bryophytes <u> </u>		
(Where applicable)				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
Remarks: <u>10% lichen</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-6									hor:Oe
6-14	7.5YR 3/2	100					No	Loam	hor:A/B 5% course rounded gravel.
14-22	7.5 YR 4/3	30					No	Fine Sandy Loam	hor:B 25% course rounded gravel.
14-22	7.5YR 3/2	70					No	Fine Sandy Loam	hor:B 25% course rounded gravel.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		
Type: None		
Depth (inches):		
Field Drainage Class: MWD - Moderately Well Drained		
	Hydric Soil Present?	Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches):		
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches):		
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches):		
(includes capillary fringe)		
	Wetland Hydrology Present?	Yes <input type="checkbox"/> X <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Soil profile dry throughout. No primary hydrology indicators observed but two secondary indicators present.

Geomorphic Position: Depression.

Additional Reference Data: Overflow Vegetation

HDR1246_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Salix pulchra	1	No	FAC

Additional Reference Data: Photos

HDR1246_18



Photo Name: Photo_180724134003



Photo Name: Photo_180724134031



Photo Name: Photo_180724134105



Photo Name: Photo_180724134015



Photo Name: Photo_180724134049



Photo Name: Photo_180724134124

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/24/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR1247_18</u>	
Investigators: <u>ZH, AH</u>	Landform (hillslope, terrace, etc.): <u>Footslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>1</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.901398</u>	Long: <u>-155.286743</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Shrub Birch – Willow (SBW)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Betula glandulosa</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Rhododendron tomentosum</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
4. <u>Salix pulchra</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FAC species <u>157</u> x3= <u>471</u>
5. <u>Vaccinium uliginosum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>4</u> x4= <u>16</u>
6. <u>Vaccinium vitis-idaea</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>136</u>				Column Totals: <u>161</u> (A) <u>487</u> (B)
50% of total cover: <u>68</u>				<u>Prevalence Index = B/A=</u> <u>3.02</u>
20% of total cover: <u>27.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex microchaeta</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Festuca altaica</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Chamaenerion angustifolium</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>25</u>				
50% of total cover: <u>12.5</u>				
20% of total cover: <u>5</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>1</u>				Vegetation
% Cover of Wetland Bryophytes <u> </u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes ³ <u> </u>				Present?
(Where applicable)				
Remarks: <u>Sal pul growing in below Bet gla. Lichen 3%.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2							N/A		hor:Oi
2-5							N/A		hor:Oe
5-8	7.5YR3/1	95	5YR3/4	5	C	M	No	Very Fine Sandy	hor:A/B
8-12	7.5YR3/3	85					No	Very Fine Sandy	hor:B1
8-12	7.5YR3/1	15					No	Very Fine Sandy	hor:B1
12-20	7.5YR4/4	100					No	Very Fine Sandy	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present): Type: None. Depth (inches): Field Drainage Class: WD - Well Drained	Hydric Soil Present? Yes No X
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Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes No X Depth (inches): Water Table Present? Yes No X Depth (inches): Saturation Present? Yes No X Depth (inches): (includes capillary fringe)	Wetland Hydrology Present? Yes No X
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Soil profile dry throughout. No hydrology indicators observed.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR1247_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<i>Spiraea stevenii</i>	3	No	FACU

Additional Reference Data: Photos

HDR1247_18



Photo Name: Photo_180724150432



Photo Name: Photo_180724150635

Additional Reference Data: Photos

HDR1247_18



Photo Name: Photo_180724150519



Photo Name: Photo_180724150548



Photo Name: Photo_180724150618

Additional Reference Data: Photos

HDR1247_18



Photo Name: Photo_180724150415



Photo Name: Photo_180724150604

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/19/2018
 Applicant/Owner: PLP Sampling Point: HDR2003_18
 Investigators: MNW, ATH Landform (hillslope, terrace, etc.): Footslope
 Local Relief (concave, convex, none): None Slope(%): 4 HGM: Slope
 Subregion (LRR): X Lat: 59.888783 Long: -155.436890 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/EM1B

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Carex (DEST-C)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Empetrum nigrum</u>	50	Yes	FAC	OBL species <u>35</u> x1= <u>35</u>
2. <u>Betula nana</u>	35	Yes	FAC	FACW species <u>7</u> x2= <u>14</u>
3. <u>Vaccinium uliginosum</u>	30	Yes	FAC	FAC species <u>120</u> x3= <u>360</u>
4. <u>Ledum decumbens</u>	5	No	FAC	FACU species <u>12</u> x4= <u>48</u>
5. <u>Spiraea stevenii</u>	5	No	FACU	UPL species <u> </u> x5= <u> </u>
6. <u>Andromeda polifolia</u>	2	No	FACW	Column Totals: <u>174</u> (A) <u>457</u> (B)
Total Cover: <u>127</u>				<u>Prevalence Index = B/A =</u> <u>2.63</u>
50% of total cover: <u>63.5</u>				
20% of total cover: <u>25.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex pluriflora</u>	30	Yes	OBL	<u>X</u> Dominance Test is >50%
2. <u>Luzula multiflora</u>	5	No	FACU	<u>X</u> Prevalence Index is ≤3.0
3. <u>Rubus chamaemorus</u>	5	No	FACW	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Carex aquatilis</u>	5	No	OBL	<u> </u> data in Remarks or on a separate sheet)
5. <u>Anemone narcissiflora</u>	2	No	FACU	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>47</u>				
50% of total cover: <u>23.5</u>				
20% of total cover: <u>9.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>60</u> % Cover of Bryophytes <u>90</u>				Yes <u>X</u> No <u> </u>
(Where applicable)				Present?

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3								Organic	hor:Oi
3-20								Organic	hor:Oe

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <u> X </u> No <u> </u>
Type:	<u>None</u>	
Depth (inches):	<u>Not Observed At 22</u>	
Field Drainage Class:	<u>PD - Poorly Drained</u>	

Remarks: Mucky peat to depth.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:			Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):	
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Original field measurement for water table unavailable, although the original note of high water table was retained. The soil pit photographs shows presence of a water table, which is estimated to be at 12 inches based on the photograph.

Geomorphic Position: Footslope close to toeslope.

Additional Reference Data: Photos

HDR2003_18



Photo Name: Photo_180619110137



Photo Name: Photo_180619110123



Photo Name: Photo_180619112424

Photo Name: Photo_180619112616



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/19/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2005b_18</u>	
Investigators: <u>MNW, ATH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>5</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.889481</u>	Long: <u>-155.435287</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Open Willow Low Shrub (OWLS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>2</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Empetrum nigrum</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Spiraea beauverdiana</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	FACW species <u>1</u> x2= <u>2</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>185</u> x3= <u>555</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>20</u> x4= <u>80</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>90</u>				Column Totals: <u>206</u> (A) <u>637</u> (B)
50% of total cover: <u>45</u>				Prevalence Index = B/A= <u>3.09</u>
20% of total cover: <u>18</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Veratrum viride</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Lupinus nootkatensis</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Sanguisorba menziesii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Geranium erianthum</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Pyrola asarifolia</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
7. <u>Viola langsdorffii</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>116</u>				
50% of total cover: <u>58</u>				
20% of total cover: <u>23.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u> </u>				Yes <u>X</u> No <u> </u>
(Where applicable)				Present?

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1							N/A	Organic	hor:Oi Fibric
1-3							N/A	Organic	hor:Oe Hemic
3-7	7.5YR 2.5/2	100					No	Sandy Loam	hor:A
7-17	7.5YR 3/3	100					No	Loam	hor:B1 Gravel common.
17-19	10YR 4/3	80	7.5YR 4/6	20	C	M	No	Silt Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches): N/A	
Field Drainage Class: MWD - Moderately Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X

Remarks: Alpha alpha test negative. No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input checked="" type="checkbox"/> X No <input type="checkbox"/> Depth (inches): 8.0	
Saturation Present? Yes <input checked="" type="checkbox"/> X No <input type="checkbox"/> Depth (inches): 6.0	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> X No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2005b_18



Photo Name: Photo_180619131316



Photo Name: Photo_180619131327

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/19/2018
 Applicant/Owner: PLP Sampling Point: HDR2007b_18
 Investigators: MNW, ATH Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 4 HGM: N/A
 Subregion (LRR): X Lat: 59.888592 Long: -155.432175 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>			

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u>
2. <u>Salix pulchra</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Spiraea beauverdiana</u>	<u>15</u>	<u>No</u>	<u>FACU</u>	FACW species <u>7</u> x2= <u>14</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>160</u> x3= <u>480</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>42</u> x4= <u>168</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>95</u>				Column Totals: <u>209</u> (A) <u>662</u> (B)
50% of total cover: <u>47.5</u>				<u>Prevalence Index = B/A=</u> <u>3.17</u>
20% of total cover: <u>19</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Epilobium angustifolium</u>	<u>15</u>	<u>No</u>	<u>FACU</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Lupinus nootkatensis</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Veratrum viride</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Rubus chamaemorus</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Anemone narcissiflora</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Viola langsdorffii</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>114</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>57</u>				
20% of total cover: <u>22.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u> % Cover of Wetland Bryophytes <u>5</u> % Cover of Bryophytes <u>60</u> (Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1							N/A	Organic	hor:Oi
1-5							N/A	Organic	hor:Oe
5-7	10YR 3/4	100					N/A	Silt Loam	hor:B *3

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):					
Type:	None				
Depth (inches):	N/A				
Field Drainage Class:	SED - Somewhat Excessively Drained				

Remarks: Cobble and gravel at 7 inches. No hydric soil indicators observed. Field site and soil pit very dry, despite wetter than normal antecedent precipitation.
³: Gravel common throughout B horizon. Cobble and gravel layer starting at 7 inches.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:					
Surface Water Present?	Yes	No	X	Depth (inches):	
Water Table Present?	Yes	No	X	Depth (inches):	
Saturation Present?	Yes	No	X	Depth (inches):	
(includes capillary fringe)					
			Wetland Hydrology Present?	Yes	No
					X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No saturation. No water table. No primary or secondary hydrology indicators observed.

Geomorphic Position:

Additional Reference Data: Photos

HDR2007b_18



Photo Name: Photo_180619154957



Photo Name: Photo_180619155013



Photo Name: Photo_180619154949

Additional Reference Data: Photos

HDR2007b_18



Photo Name: Photo_180619155006



Photo Name: Photo_180619155023



Photo Name: Photo_180619155033

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/20/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2010_18</u>	
Investigators: <u>MNW, ATH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>12</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.874047</u>	Long: <u>-155.450197</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Open Willow Low Shrub (OWLS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>80</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>65</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Empetrum nigrum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
3. <u>Salix reticulata</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FAC species <u>153</u> x3= <u>459</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>37</u> x4= <u>148</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u>5</u> x5= <u>25</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>195</u> (A) <u>632</u> (B)
Total Cover: <u>120</u>				<u>Prevalence Index = B/A=</u> <u>3.24</u>
50% of total cover: <u>60</u>				
20% of total cover: <u>24</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Festuca altaica</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Anemone narcissiflora</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Geranium erianthum</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Epilobium angustifolium</u>	<u>8</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Hierochloe alpina</u>	<u>5</u>	<u>No</u>	<u>NL</u>	
7. <u>Angelica lucida</u>	<u>4</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Sedum rosea ssp. integrifolium</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Anemone richardsonii</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>75</u>				
50% of total cover: <u>37.5</u>				
20% of total cover: <u>15</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic
% Cover of Wetland Bryophytes <u>20</u> % Cover of Bryophytes <u>65</u>				Vegetation
(Where applicable)				Yes <u>X</u> No <u> </u>
				Present?
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2							N/A	Organic	hor:Oe
2-6							N/A	Organic	hor:Oa
6-16	7.5YR 2.5/2	100					No	Sandy Loam	hor:A Gravels and cobbles common.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):					
Type:	None				
Depth (inches):	N/A				
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks: Histic over cobble. Neg alpha alpha test. High organic content in mineral soil below.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:					
Surface Water Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Depth (inches):	1.0	
Water Table Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Depth (inches):	1.0	
Saturation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Depth (inches):	0.0	
(includes capillary fringe)					
			Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/> X <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Small pockets of ponded water

Geomorphic Position:



Photo Name: Photo_180620074307



Photo Name: Photo_180620084525



Photo Name: Photo_180620074319

Additional Reference Data: Photos

HDR2010_18



Photo Name: Photo_180620075024



Photo Name: Photo_180620074229



Photo Name: Photo_180620074332

Photo Name: Photo_180620074257



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/20/2018
 Applicant/Owner: PLP Sampling Point: HDR2013_18
 Investigators: MNW ATH Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 0 HGM: Slope
 Subregion (LRR): X Lat: 59.876087 Long: -155.448807 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PEM1C

Vegetation Type: Fresh Sedge Marsh (FSM)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: Wetter than normal antecedent precipitation.					

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>67</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u>95</u> <u>Multiply by:</u>
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	OBL species <u>95</u> x1= <u>95</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u> </u> x2= <u> </u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>15</u> x3= <u>45</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u> </u> x4= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>15</u>				Column Totals: <u>110</u> (A) <u>140</u> (B)
50% of total cover: <u>7.5</u>				<u>Prevalence Index = B/A=</u> <u>1.27</u>
20% of total cover: <u>3</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Eriophorum angustifolium</u>	<u>80</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Dominance Test is >50%
2. <u>Juncus sp.</u>	<u>25</u>	<u>Yes</u>	<u>N/A</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Trichophorum caespitosum</u>	<u>15</u>	<u>No</u>	<u>OBL</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>120</u>				
50% of total cover: <u>60</u>				
20% of total cover: <u>24</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				Vegetation
(Where applicable)				Yes <u>X</u> No <u> </u>
				Present?
Remarks:				
FSM				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3								Organic	hor:Oe
3-7	10 YR 2/2							Sandy Loam	hor:B1 With Gravel
7-18	7.5 YR 3/2							Sandy Loam	hor:B2 With Gravel

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			
Type:	None		
Depth (inches):	N/A		
Field Drainage Class:	PD - Poorly Drained		
		Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks: Hydrogen sulfide odor at 4 inches.

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)					
<input checked="" type="checkbox"/> Surface Water (A1)		<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input type="checkbox"/> Water Marks (B1)		<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input checked="" type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input type="checkbox"/> Microtopographic Relief (D4)		
			<input checked="" type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations:					
Surface Water Present?	Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	2.0	
Water Table Present?	Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	0.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	0.0	
(includes capillary fringe)					
			Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Flat terrace on slope.

Geomorphic Position: Flat terrace on slope

Additional Reference Data: Photos

HDR2013_18



Photo Name: Photo_180620130852



Photo Name: Photo_180620130938



Photo Name: Photo_180620130918

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/20/2018
 Applicant/Owner: PLP Sampling Point: HDR2014_18
 Investigators: MNW, ATH Landform (hillslope, terrace, etc.): Footslope
 Local Relief (concave, convex, none): None Slope(%): _____ HGM: Slope
 Subregion (LRR): X Lat: 59.875793 Long: -155.448868 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/EM1B

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)
 Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation: _____ Soil X or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____		
Wetland Hydrology Present?	Yes <u>X</u>	No _____		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>2</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> _____ <u>Multiply by:</u> _____
2. <u>Salix pulchra</u>	<u>25</u>	<u>No</u>	<u>FAC</u>	OBL species _____ x1= _____
3. <u>Betula nana</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACW species _____ x2= _____
4. <u>Salix reticulata</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FAC species <u>160</u> x3= <u>480</u>
5. _____	_____	_____	_____	FACU species <u>2</u> x4= <u>8</u>
6. _____	_____	_____	_____	UPL species _____ x5= _____
Total Cover: <u>135</u>				Column Totals: <u>162</u> (A) <u>488</u> (B)
50% of total cover: <u>67.5</u>				<u>Prevalence Index = B/A=</u> <u>3.01</u>
20% of total cover: <u>27</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Anemone narcissiflora</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. _____	_____	_____	_____	Morphological Adaptations ¹ (Provide
4. _____	_____	_____	_____	data in Remarks or on a separate sheet)
5. _____	_____	_____	_____	Problematic Hydrophytic Vegetation ¹ (Explain)
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology
9. _____	_____	_____	_____	must be present, unless disturbed or problematic.
10. _____	_____	_____	_____	
Total Cover: <u>27</u>				
50% of total cover: <u>13.5</u>				
20% of total cover: <u>5.4</u>				
Plot size (radius, or length x width) <u>30 x 30 ft</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No _____
(Where applicable)				Present?

Remarks: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1							N/A	Organic	hor:Oi
1-7							N/A	Organic	hor:Oa *2
7-20	10YR 2/2	100					No	Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input checked="" type="checkbox"/>	Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type:	None		Yes	<input checked="" type="checkbox"/>	No
Depth (inches):	N/A				
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks: Not quite enough organics to call a Histic Epipedon. However, based on landscape position (flatter footslope), the fact that inundation is visible in summer 2004 imagery, site visit photos dated September 15, 2006, and that there was a significant amount of drainage features and low spots that were inundated at the time of this site visit in 2018, this site is considered a wetland. Flatter areas along the footslope had significant ponding of water and H2S. *2: Wavy boundary to 8 inches in spots.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input checked="" type="checkbox"/> No	Depth (inches):	1.0	
Water Table Present?	Yes	<input checked="" type="checkbox"/> No	Depth (inches):	6.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> No	Depth (inches):	0.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:



Photo Name: Photo_180620122848



Photo Name: Photo_180620122907



Photo Name: Photo_180620122856

Additional Reference Data: Photos

HDR2014_18



Photo Name: Photo_180620122827



Photo Name: Photo_180620122913



Photo Name: Photo_180620122807

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	6/20/2018
Applicant/Owner:	PLP			Sampling Point:	HDR2015_18
Investigators:	MNW ATH	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	Convex	Slope(%):	5	HGM:	N/A
Subregion (LRR):	X	Lat:	59.876072	Long:	-155.448868
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	U		

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u> </u> X
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			

Tree Stratum				Dominance Test Worksheet:			
		Absolute % Cover	Dominant Species?	Indicator Status			
1.					Number of Dominant Species		
2.					That Are OBL, FACW, or FAC: 3 (A)		
3.					Total Number of Dominant		
4.					Species Across All Strata: 4 (B)		
Total Cover: _____					Percent of Dominant Species		
50% of total cover: 0			20% of total cover: 0		That Are OBL, FACW, or FAC: 75 (A/B)		
Sapling/Shrub Stratum				Prevalence Index worksheet:			
1.	Salix pulchra	40	Yes	FAC	Total % Cover of: _____ Multiply by: _____		
2.	Empetrum nigrum	20	Yes	FAC	OBL species	x1= _____	
3.	Spiraea beauverdiana	20	Yes	FACU	FACW species	20 x2= 40	
4.	Salix reticulata	10	No	FAC	FAC species	155 x3= 465	
5.					FACU species	39 x4= 156	
6.					UPL species	x5= _____	
Total Cover: 90					Column Totals:	214 (A)	661 (B)
50% of total cover: 45			20% of total cover: 18		Prevalence Index = B/A= 3.09		
Herb Stratum				Hydrophytic Vegetation Indicators:			
1.	Calamagrostis canadensis	85	Yes	FAC	X	Dominance Test is >50%	
2.	Angelica lucida	15	No	FACU		Prevalence Index is ≤3.0	
3.	Sanguisorba canadensis	15	No	FACW		Morphological Adaptations ¹ (Provide	
4.	Petasites frigidus s.l.	5	No	FACW		data in Remarks or on a separate sheet)	
5.	Geranium erianthum	4	No	FACU		Problematic Hydrophytic Vegetation ¹ (Explain)	
6.							
7.							
8.							
9.							
10.							
Total Cover: 124							
50% of total cover: 62			20% of total cover: 24.8				
Plot size (radius, or length x width) 1/10 acre				% Bare Ground _____			
% Cover of Wetland Bryophytes 0		% Cover of Bryophytes 65					
(Where applicable)							
				Hydrophytic Vegetation Present? Yes X No _____			

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Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1							N/A	Organic	hor:Oi
1-3							N/A	Organic	hor:Oe
3-4							N/A	Organic	hor:Oa
4-8	7.5YR 3/2	100					N/A	Silt Loam	hor:B1 Some gravel.
8-20	10YR 3/2	100					N/A	Silt Loam	hor:B2 Gravel common.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type:	None		Yes	No	X
Depth (inches):	N/A				
Field Drainage Class:	MWD - Moderately Well Drained				

Remarks: Large hummocks.

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input checked="" type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input type="checkbox"/> FAC-Neutral Test (D5)		
Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):	Yes	X	No
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):			
Saturation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):			
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:



Photo Name: Photo_180620134106



Photo Name: Photo_180620134035



Photo Name: Photo_180620134005

Additional Reference Data: Photos

HDR2015_18



Photo Name: Photo_180620134057



Photo Name: Photo_180620134044

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/20/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2016_18</u>	
Investigators: <u>MNW ATH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): _____	Slope(%): <u>5</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.877586</u>	Long: <u>-155.449844</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra – Carex (DEST-C)</u>		NWI Classification: <u>PSS1/EM1B</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)

Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____		
Wetland Hydrology Present? Yes <u>X</u> No _____		
Remarks: <u>Wetter than normal antecedent precipitation.</u>		

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>4</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Vaccinium uliginosum</u>	<u>65</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> _____ <u>Multiply by:</u> _____
2. <u>Empetrum nigrum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>10</u> x1= <u>10</u>
3. <u>Betula nana</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>1</u> x2= <u>2</u>
4. <u>Ledum decumbens</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FAC species <u>220</u> x3= <u>660</u>
5. <u>Salix reticulata</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACU species <u>1</u> x4= <u>4</u>
6. _____	_____	_____	_____	UPL species _____ x5= _____
Total Cover: <u>180</u>				Column Totals: <u>232</u> (A) <u>676</u> (B)
50% of total cover: <u>90</u>				<u>Prevalence Index = B/A=</u> <u>2.91</u>
20% of total cover: <u>36</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Eriophorum angustifolium</u>	<u>10</u>	<u>No</u>	<u>OBL</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Anemone parviflora</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Pedicularis langsдорфii</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Lycopodium sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	
7. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology
8. _____	_____	_____	_____	must be present, unless disturbed or problematic.
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>53</u>				
50% of total cover: <u>26.5</u>				
20% of total cover: <u>10.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>50</u>				Yes <u>X</u> No _____
% Cover of Bryophytes <u>90</u>				Present?
(Where applicable)				
Remarks:				
DEST-C				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3							N/A		hor:Oi
3-4							N/A		hor:Oe
4-7	10YR 3/2	10					N/A	Sandy Loam	hor:B
7-16	10YR 4/2	98	10YR 4/4	2		M	No	Sandy Loam	hor:C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <u> X </u> No <u> </u>
Type:	<u>None</u>	
Depth (inches):	<u>N/A</u>	
Field Drainage Class:	<u>PD - Poorly Drained</u>	

Remarks: High amount of gravel and cobble at 16 inches.

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Water Marks (B1)		<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input checked="" type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations:			Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No	
Surface Water Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):				
Water Table Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):				
Saturation Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):				
(includes capillary fringe)							

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2016_18



Photo Name: Photo_180620152504



Photo Name: Photo_180620152456



Photo Name: Photo_180620152435

Additional Reference Data: Photos

HDR2016_18



Photo Name: Photo_180620152317



Photo Name: Photo_180620152447



Photo Name: Photo_180620152418

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/21/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2018_18</u>	
Investigators: <u>MNW ATH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>6</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.875362</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PEM1/SS1B</u>	

Vegetation Type: Bluejoint Herb (BH)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>6</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>83</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	35	Yes	FAC	OBL species <u>2</u> x1= <u>2</u>
2. <u>Empetrum nigrum</u>	25	Yes	FAC	FACW species <u>16</u> x2= <u>32</u>
3. <u>Vaccinium uliginosum</u>	15	No	FAC	FAC species <u>166</u> x3= <u>498</u>
4. <u>Betula nana</u>	5	No	FAC	FACU species <u>21</u> x4= <u>84</u>
5. <u>Salix reticulata</u>	5	No	FAC	UPL species <u>6</u> x5= <u>30</u>
6. <u>Spiraea beauverdiana</u>	5	No	FACU	Column Totals: <u>211</u> (A) <u>646</u> (B)
Total Cover: <u>92</u>				<u>Prevalence Index = B/A=</u> <u>3.06</u>
50% of total cover: <u>46</u>				
20% of total cover: <u>18.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	60	Yes	FAC	<u>X</u> Dominance Test is >50%
2. <u>Iris setosa</u>	10	Yes	FAC	Prevalence Index is ≤3.0
3. <u>Geranium erianthum</u>	10	Yes	FACU	Morphological Adaptations ¹ (Provide
4. <u>Sanguisorba canadensis</u>	10	Yes	FACW	data in Remarks or on a separate sheet)
5. <u>Veratrum viride</u>	5	No	FAC	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Anemone narcissiflora</u>	5	No	FACU	
7. <u>Deschampsia sp.</u>	5	No	N/A	¹ Indicators of hydric soil and wetland hydrology
8. <u>Lagotis glauca s.l.</u>	5	No	NL	must be present, unless disturbed or problematic.
9. <u>Festuca altaica</u>	2	No	FAC	
10. <u>Fritillaria camschatcensis</u>	2	No	FAC	
Total Cover: <u>124</u>				
50% of total cover: <u>62</u>				
20% of total cover: <u>24.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic Vegetation Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2							N/A	Organic	hor:Oe
2-8							N/A	Organic	hor:Oa *2
8-18	10YR 2/2	100					No	Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type:	None		Yes	<input checked="" type="checkbox"/> X	No
Depth (inches):	N/A				
Field Drainage Class:	PD - Poorly Drained				

Remarks: *2: Wavy boundary. Rock beneath base of 8". Some mineral.

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input checked="" type="checkbox"/> X FAC-Neutral Test (D5)		

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	1.0	
Water Table Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	0.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	0.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2018_18

	Absolute % Cover	Dominant Species?	Indicator Status
Herb			
Sedum rosea ssp. integrifolium	2	No	FAC
Ranunculus occidentalis	2	No	FACW
Eriophorum angustifolium	2	No	OBL
Lupinus nootkatensis	1	No	FACU
Viola langsdorffii	1	No	FACW
Primula eximia	1	No	NL
Sapling/Shrub			
Andromeda polifolia	2	No	FACW

Additional Reference Data: Photos

HDR2018_18



Photo Name: Photo_180621090519



Photo Name: Photo_180621080928



Photo Name: Photo_180621080936



Photo Name: Photo_180621080941



Photo Name: Photo_180621084727



Photo Name: Photo_180621080948

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/22/2018
 Applicant/Owner: PLP Sampling Point: HDR2021_18
 Investigators: MNW ATH Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 12 HGM: N/A
 Subregion (LRR): X Lat: 59.877953 Long: -155.445892 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			

Remarks: Surface water observed in some micro-lows. 3PP photo point shows surface water present. Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75</u> (A/B)
Total Cover: <u> </u>				Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: <u> </u> OBL species <u> </u> x1= <u> </u> FACW species <u>10</u> x2= <u>20</u> FAC species <u>152</u> x3= <u>456</u> FACU species <u>18</u> x4= <u>72</u> UPL species <u>21</u> x5= <u>105</u> Column Totals: <u>201</u> (A) <u>653</u> (B)
50% of total cover: <u>0</u>				
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index = B/A = <u>3.25</u>
1. <u>Empetrum nigrum</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: X Dominance Test is >50% Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Salix reticulata</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Dryas octopetala</u>	<u>20</u>	<u>No</u>	<u>NL</u>	
4. <u>Vaccinium uliginosum</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	
5. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
6. <u>Loiseleuria procumbens</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>163</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>81.5</u>				
20% of total cover: <u>32.6</u>				
Herb Stratum				
1. <u>Festuca altaica</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Anemone narcissiflora</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Ranunculus occidentalis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
4. <u>Angelica lucida</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
5. <u>Lycopodium sp.</u>	<u>2</u>	<u>No</u>	<u>N/A</u>	
6. <u>Lagotis glauca s.l.</u>	<u>1</u>	<u>No</u>	<u>NL</u>	
Total Cover: <u>40</u>				
50% of total cover: <u>20</u>				
20% of total cover: <u>8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u>40</u>				
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2							N/A	Organic	hor:Oe
2-6							N/A	Organic	hor:Oa
6-13	10YR 2/1	100					No	Sandy Loam	hor:B *3

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):					
Type:	None				
Depth (inches):	N/A		Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>		
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks: No hydric soil indicators observed. *3: Gravel Throughout. Cobble At 13inches.

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)					
<input checked="" type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input type="checkbox"/> Microtopographic Relief (D4)		
			<input type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations:									
Surface Water Present?	Yes	<u>X</u>	No	<u> </u>	Depth (inches):	<u> 5.0 </u>			
Water Table Present?	Yes	<u>X</u>	No	<u> </u>	Depth (inches):	<u> 1.0 </u>			
Saturation Present?	Yes	<u>X</u>	No	<u> </u>	Depth (inches):	<u> 0.0 </u>	Wetland Hydrology Present? Yes <u> X </u> No <u> </u>		
(includes capillary fringe)									

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Surface water observed in some micro-lows. 3PP photo point shows surface water present.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

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	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Andromeda polifolia	5	No	FACW
Salix arctica	2	No	FAC
Picea glauca	1	No	FACU

Additional Reference Data: Photos

HDR2021_18

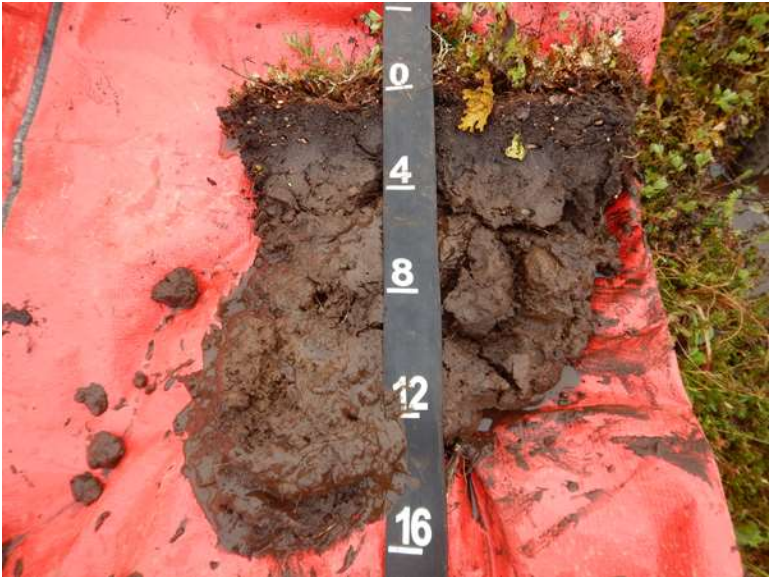


Photo Name: DSCN2969



Photo Name: DSCN2970



Photo Name: DSCN2971



Photo Name: DSCN2972



Photo Name: DSCN2973



Photo Name: DSCN2974



Photo Name: DSCN2975

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/23/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2022_18</u>	
Investigators: <u>MNW, ATH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>10</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.878048</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PEM1/SS1B</u>	

Vegetation Type: Bluejoint Herb (BH)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u>
2. <u>Betula nana</u>	<u>2</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium uliginosum</u>	<u>2</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>9</u> x2= <u>18</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>119</u> x3= <u>357</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>19</u> x4= <u>76</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>9</u>				Column Totals: <u>147</u> (A) <u>451</u> (B)
50% of total cover: <u>4.5</u>				<u>Prevalence Index = B/A=</u> <u>3.07</u>
20% of total cover: <u>1.8</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>95</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Sedum rosea ssp. integrifolium</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Epilobium angustifolium</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Angelica lucida</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Anemone narcissiflora</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
7. <u>Dryopteris expansa</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Petasites frigidus s.l.</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	must be present, unless disturbed or problematic.
9. <u>Rubus chamaemorus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
10. <u>Carex sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	
Total Cover: <u>139</u>				
50% of total cover: <u>69.5</u>				
20% of total cover: <u>27.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes <u>20</u>				
(Where applicable)				
Remarks:				
<u>Cal can meadow delineated out of the target polygon.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1							N/A	Organic	hor:Oi
1-6							N/A	Organic	hor:Oe
6-8							N/A	Organic	hor:Oa
8-16	10YR 3/2	100					N/A	Loam	hor:B *4

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks: *4: With gravel. Could not get below 16" due to gravel.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> X No <input type="checkbox"/>	
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches): <input type="text"/>		
Water Table Present?	Yes <input type="checkbox"/> X No <input type="checkbox"/> Depth (inches): <input type="text"/> 4.0		
Saturation Present?	Yes <input type="checkbox"/> X No <input type="checkbox"/> Depth (inches): <input type="text"/> 0.0 (includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Water in pit.

Geomorphic Position:

Additional Reference Data: Photos

HDR2022_18



Photo Name: DSCN2976



Photo Name: DSCN2977



Photo Name: DSCN2978

Additional Reference Data: Photos

HDR2022_18



Photo Name: DSCN2979



Photo Name: DSCN2980

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/23/2018
 Applicant/Owner: PLP Sampling Point: HDR2023_18
 Investigators: MNW, ATH Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 14 HGM: N/A
 Subregion (LRR): X Lat: 59.873070 Long: -155.468933 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:	
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>6</u> (A)	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>8</u> (B)	
Total Cover: <u> </u>				Percent of Dominant Species	
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>75</u> (A/B)	
20% of total cover: <u>0</u>					
Sapling/Shrub Stratum				Prevalence Index worksheet:	
1. <u>Salix pulchra</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:	
2. <u>Empetrum nigrum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>18</u> x2= <u>36</u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>144</u> x3= <u>432</u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>26</u> x4= <u>104</u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>	
Total Cover: <u>80</u>				Column Totals: <u>188</u> (A) <u>572</u> (B)	
50% of total cover: <u>40</u>				Prevalence Index = B/A= <u>3.04</u>	
20% of total cover: <u>16</u>					
Herb Stratum				Hydrophytic Vegetation Indicators:	
1. <u>Calamagrostis canadensis</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%	
2. <u>Carex bigelowii</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0	
3. <u>Geranium erianthum</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide	
4. <u>Equisetum arvense</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	data in Remarks or on a separate sheet)	
5. <u>Equisetum sylvaticum</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)	
6. <u>Anemone narcissiflora</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>		
7. <u>Ranunculus occidentalis</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology	
8. <u>Sedum rosea ssp. integrifolium</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.	
9. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>		
10. <u>Valeriana capitata</u>	<u>2</u>	<u>No</u>	<u>FAC</u>		
Total Cover: <u>108</u>					
50% of total cover: <u>54</u>					
20% of total cover: <u>21.6</u>					
Plot size (radius, or length x width) <u>1/10 acre</u>					
% Bare Ground <u>0</u>					
% Cover of Wetland Bryophytes <u>20</u>					
% Cover of Bryophytes <u>65</u>					
(Where applicable)					
Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>					

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4							N/A	Organic	hor:Oi
4-16	2.5Y 3/2	93	2.5YR 3/4	7	C	PL	N/A	Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:

Indicators for Problematic Hydric Soils³:

Histosol or Histel (A1)

Histic Epipedon (A2)

Hydrogen Sulfide (A4)

Thick Dark Surface (A12)

Alaska Gleyed (A13)

Alaska Redox (A14)

Alaska Gleyed Pores (A15)

Alaska Color Change (TA4)⁴

Alaska Alpine Swales (TA5)

Alaska Redox With 2.5Y Hue

Alaska Gleyed Without Hue 5Y or Redder

Underlying Layer

Other (Explain in Remarks)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

Restrictive Layer (if present):

Type: None

Depth (inches): N/A

Field Drainage Class:

Hydric Soil Present?

Yes

No

X

Remarks: Not enough redox concentrations observed to meet the indicators for problematic hydric soil. Additionally, no hydric soil indicators were observed in second soil pit dug nearby first pit: 0-1" Oi, 1-4" Oe, 4-5" Oa, 5-7" B loam 10YR 3/2 100%, 7-9" B loam 10YR 2/2 100%, 9-12" B 10YR 3/2 sandy loam, 12-16" B loamy sand 10YR 3/2 100%.

HYDROLOGY

Wetland Hydrology Indicators:

Secondary Indicators (2 or more required)

Primary Indicators (minimum of one required; check all that apply)

X

Surface Water (A1)

X

High Water Table (A2)

X

Saturation (A3)

Water Marks (B1)

Sediment Deposits (B2)

Drift Deposits (B3)

Algal Mat or Crust (B4)

Iron Deposits (B5)

Surface Soil Cracks (B6)

Inundation Visible on Aerial Imagery (B7)

Sparsely Vegetated Concave Surface (B8)

Marl Deposits (B15)

Hydrogen Sulfide Odor (C1)

Dry Season Water Table (C2)

Other (Explain in Remarks)

X

Water-stained Leaves (B9)

X

Drainage Patterns (B10)

Oxidized Rhizospheres along Living Roots (C3)

Presence of Reduced Iron (C4)

Salt Deposits (C5)

Stunted or Stressed Plants (D1)

Geomorphic Position (D2)

Shallow Aquitard (D3)

Microtopographic Relief (D4)

FAC-Neutral Test (D5)

Field Observations:

Wetland Hydrology Present?

Surface Water Present?

Yes

X

No

Depth (inches): 1.0

Water Table Present?

Yes

X

No

Depth (inches): 4.0

Saturation Present?

Yes

X

No

Depth (inches): 0.0

(includes capillary fringe)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Original surface water depth measurement unavailable. Surface water depth was approximated using site photographs, which appears to be between at least 1-2 inches.

Geomorphic Position: Streams occurring every 15-25ft. Streams were between 6-12 inches in width and incised approximately 1-2ft. Unconsolidated bottom. Steep 14-20% slope.

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Additional Reference Data: Overflow Vegetation

HDR2023_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Anemone richardsonii	1	No	FAC
Saxifraga punctata s.l.	1	No	FAC
Gymnocarpium dryopteris	1	No	FACU
Petasites frigidus s.l.	1	No	FACW
Rubus chamaemorus	1	No	FACW
Viola langsdorffii	1	No	FACW

Additional Reference Data: Photos

HDR2023_18



Photo Name: 2023_06212018_1a



Photo Name: 2023_06212018_1b

Additional Reference Data: Photos

HDR2023_18



Photo Name: 2023_06212018_1c



Photo Name: 2023_06212018_2



Photo Name: 2023_06212018_3

Additional Reference Data: Photos

HDR2023_18



Photo Name: 2023_06212018_4



Photo Name: 2023_06212018_5

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 6/23/2018
 Applicant/Owner: PLP Sampling Point: HDR2024_18
 Investigators: MNW, ATH Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 3 HGM: Slope
 Subregion (LRR): X Lat: 59.875748 Long: -155.468781 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/EM1C

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Empetrum nigrum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Betula nana</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>2</u> x2= <u>4</u>
3. <u>Salix pulchra</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FAC species <u>136</u> x3= <u>408</u>
4. <u>Vaccinium uliginosum</u>	<u>11</u>	<u>No</u>	<u>FAC</u>	FACU species <u>2</u> x4= <u>8</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>140</u> (A) <u>420</u> (B)
Total Cover: <u>86</u>				<u>Prevalence Index = B/A=</u> <u>3.00</u>
50% of total cover: <u>43</u>				
20% of total cover: <u>17.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum sylvaticum</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Anemone narcissiflora</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Juncus castaneus</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Rubus chamaemorus</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>54</u>				
50% of total cover: <u>27</u>				
20% of total cover: <u>10.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>35</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>75</u>				Present?
(Where applicable)				

Remarks:
 DEST-H. A large amount of sphagnum. Feather moss also present.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1							N/A	Organic	hor:Oi
1-10							N/A	Organic	hor:Oe With gravel and cobble.
10-16	5Y 4/3	90	10YR 4/6	10	C	RC	N/A	Sandy Loam	hor:B With cobble and gravel.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input checked="" type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <u> X </u> No <u> </u>
Type:	<u>None</u>	
Depth (inches):	<u>N/A</u>	
Field Drainage Class:	<u>PD - Poorly Drained</u>	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:			Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:



Photo Name: 2024_06212018_1



Photo Name: 2024_06212018_2



Photo Name: 2024_06212018_3

Additional Reference Data: Photos

HDR2024_18



Photo Name: 2024_06212018_4



Photo Name: 2024_06212018_5



Photo Name: 2024_06212018_6



Photo Name: 2024_06212018_7



Photo Name: 2024_06212018_8

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/22/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2025_18</u>	
Investigators: <u>MNW, ATH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>7</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u> Lat: <u>59.906517</u>	Long: <u>-155.446381</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Closed Alder – Willow Tall Shrub (CAWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil X or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: Last photo shows standing water. Wetter than normal antecedent precipitation.		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: <u> </u> OBL species <u> </u> x1= <u> </u> FACW species <u>39</u> x2= <u>78</u> FAC species <u>145</u> x3= <u>435</u> FACU species <u>7</u> x4= <u>28</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>191</u> (A) <u>541</u> (B) Prevalence Index = B/A= <u>2.83</u>
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
Sapling/Shrub Stratum				
1. <u>Salix pulchra</u>	80	Yes	FAC	Hydrophytic Vegetation Indicators: X Dominance Test is >50% X Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Alnus sinuata</u>	25	Yes	FAC	
3. <u>Spiraea beauverdiana</u>	5	No	FACU	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>110</u>				
50% of total cover: <u>55</u>		20% of total cover: <u>22</u>		
Herb Stratum				
1. <u>Equisetum pratense</u>	18	Yes	FACW	
2. <u>Sanguisorba canadensis</u>	18	Yes	FACW	
3. <u>Calamagrostis canadensis</u>	15	Yes	FAC	
4. <u>Equisetum sylvaticum</u>	10	No	FAC	
5. <u>Carex sp.</u>	10	No	N/A	
6. <u>Athyrium cyclosorum</u>	5	No	FAC	
7. <u>Veratrum viride</u>	4	No	FAC	
8. <u>Polemonium acutiflorum</u>	2	No	FAC	
9. <u>Saxifraga punctata s.l.</u>	2	No	FAC	
10. <u>Valeriana capitata</u>	2	No	FAC	
Total Cover: <u>91</u>				
50% of total cover: <u>45.5</u>		20% of total cover: <u>18.2</u>		
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u>0</u>		% Cover of Bryophytes <u>20</u>		
(Where applicable)				
Remarks: <u>Alder 6' tall, willow 4' tall.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3								Organic	hor:Oe
3-9	2.5Y 3/1	98	5YR 3/4	2	C	PL	N/A	Silt Loam	hor:B1
9-18	2.5Y 4/2	86	2.5YR 3/6	1	C	PL	Yes	Sandy Loam	hor:B2
9-18			5YR 4/6	2	C	PL	Yes	Sandy Loam	hor:B2
9-18			7.5YR 4/4	7	C	PL	Yes	Sandy Loam	hor:B2
9-18			7.5YR 5/8	4	C	M	Yes	Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:

<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input checked="" type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present): Type: <u>None</u> Depth (inches): <u>N/A</u> Field Drainage Class: <u>PD - Poorly Drained</u>	Hydric Soil Present? Yes <input type="checkbox"/> X No <input type="checkbox"/>
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-stained Leaves (B9)
<input checked="" type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input checked="" type="checkbox"/> Microtopographic Relief (D4)
	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> X No <input type="checkbox"/> Depth (inches): <u>4.0</u> Water Table Present? Yes <input type="checkbox"/> X No <input type="checkbox"/> Depth (inches): <u>0.0</u> Saturation Present? Yes <input type="checkbox"/> X No <input type="checkbox"/> Depth (inches): <u>0.0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> X No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hummocks slightly dryer, but saturated.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2025_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Streptopus amplexifolius	2	No	FACU
Senecio triangularis	2	No	FACW
Viola lanqsdorffii	1	No	FACW

Additional Reference Data: Photos

HDR2025_18



Photo Name: Photo_180622094611



Photo Name: Photo_180622085639

Additional Reference Data: Photos

HDR2025_18



Photo Name: Photo_180622091411



Photo Name: Photo_180622085701



Photo Name: Photo_180622085554



Photo Name: Photo_180622085708



Photo Name: Photo_180622085610



Photo Name: Photo_180622085545



Photo Name: Photo_180622085649

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/22/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2027_18</u>	
Investigators: <u>MNW, ATH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>5</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.905861</u>	Long: <u>-155.444107</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Closed Alder – Willow Tall Shrub (CAWTS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Alnus sinuata</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u>
2. <u>Salix pulchra</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Spiraea beauverdiana</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	FACW species <u>20</u> x2= <u>40</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>244</u> x3= <u>732</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>14</u> x4= <u>56</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>120</u>				Column Totals: <u>278</u> (A) <u>828</u> (B)
50% of total cover: <u>60</u>				<u>Prevalence Index = B/A=</u> <u>2.98</u>
20% of total cover: <u>24</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Athyrium cyclosorum</u>	<u>55</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum sylvaticum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Saxifraga punctata s.l.</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	
7. <u>Petasites frigidus s.l.</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Viola langsдорffii</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	must be present, unless disturbed or problematic.
9. <u>Rumex crispus</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	
10. <u>Epilobium angustifolium</u>	<u>4</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>158</u>				
50% of total cover: <u>79</u>				
20% of total cover: <u>31.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>40</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>10</u>				Present?
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2	10YR 3/2	100					N/A	Loam	hor:A
2-9	10YR 3/3						N/A	Loam	hor:B1
9-11	10YR 2/2	100					No	Loam	hor:B2
11-16	10YR 3/3	100					N/A	Loam	hor:B
16-19	10YR 3/4	100					No	Sandy Loam	hor:C With Gravel

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type:	None		Yes	No	X
Depth (inches):	N/A				
Field Drainage Class:	MWD - Moderately Well Drained				

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input checked="" type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input checked="" type="checkbox"/> No	Depth (inches):	1.0	
Water Table Present?	Yes	<input checked="" type="checkbox"/> No	Depth (inches):	2.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> No	Depth (inches):	0.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Small streams every 100 feet. Small PEM1B down slope on small terrace.

Geomorphic Position:

Additional Reference Data: Photos

HDR2027_18



Photo Name: Photo_180622121834



Photo Name: Photo_180622121903



Photo Name: Photo_180622121921

Additional Reference Data: Photos

HDR2027_18



Photo Name: Photo_180622121818



Photo Name: Photo_180622121849



Photo Name: Photo_180622121910

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/22/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2029_18</u>	
Investigators: <u>MNW, ATH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>2</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.907288</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Closed Alder – Willow Tall Shrub (CAWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil X or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Alnus sinuata</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium vitis-idaea</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FACW species <u>5</u> x2= <u>10</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>214</u> x3= <u>642</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>18</u> x4= <u>72</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>97</u>				Column Totals: <u>237</u> (A) <u>724</u> (B)
50% of total cover: <u>48.5</u>				<u>Prevalence Index = B/A=</u> <u>3.05</u>
20% of total cover: <u>19.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	<u>45</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Athyrium cyclosum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>18</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Equisetum sylvaticum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Saxifraga punctata s.l.</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Angelica lucida</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	
7. <u>Gymnocarpium dryopteris</u>	<u>6</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	must be present, unless disturbed or problematic.
9. <u>Sedum rosea ssp. integrifolium</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
10. <u>Viola epipsila</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>140</u>				
50% of total cover: <u>70</u>				
20% of total cover: <u>28</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>15</u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u>50</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-5							N/A	Organic	hor:Oe
5-8	10YR 3/2	97	5YR 3/4	3	C	PL	N/A	Silt Loam	hor:B1
8-13	2.5Y 3/3	88	10YR 4/6	5	C	PL	N/A	Silt Loam	hor:B2
8-13			2.5Y3/6	2	C	PL	N/A	Silt Loam	hor:B2
8-13			7.5YR 4/6	5	C	PL	N/A	Silt Loam	hor:B2
13-16	10YR 4/3	100					N/A	Sandy Loam	hor:B/C

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input checked="" type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present):	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: Boulders	
Depth (inches): 16	
Field Drainage Class: SPD - Somewhat Poorly Drained	

Remarks: Soil thickness dependent on depth to rock. Nearby rock at surface.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 2.0	
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 1.0	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0 (includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Small headwater drainage.

Geomorphic Position: Swale

Additional Reference Data: Overflow Vegetation

HDR2029_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Streptopus amplexifolius	2	No	FACU

Additional Reference Data: Photos

HDR2029_18



Photo Name: Photo_180622154446



Photo Name: Photo_180622154501



Photo Name: Photo_180622154515



Photo Name: Photo_180622154456



Photo Name: Photo_180622154431



Photo Name: Photo_180622154415

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/23/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2031_18</u>	
Investigators: <u>MNW, ATH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>13</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.909847</u>	Long: <u>-155.424179</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra (DEST)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>80</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>65</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Vaccinium uliginosum</u>	<u>45</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix pulchra</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACW species <u>12</u> x2= <u>24</u>
4. <u>Salix arctica</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	FAC species <u>161</u> x3= <u>483</u>
5. <u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>23</u> x4= <u>92</u>
6. <u>Viburnum edule</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	UPL species <u>2</u> x5= <u>10</u>
Total Cover: <u>145</u>				Column Totals: <u>198</u> (A) <u>609</u> (B)
50% of total cover: <u>72.5</u>				<u>Prevalence Index = B/A=</u> <u>3.08</u>
20% of total cover: <u>29</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Festuca altaica</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Epilobium angustifolium</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>8</u>	<u>Yes</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Fritillaria camschatcensis</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Viola epipsila</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Anemone narcissiflora</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
8. <u>Geranium erianthum</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
9. <u>Heracleum maximum</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
10. <u>Rubus chamaemorus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>53</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>26.5</u>				
20% of total cover: <u>10.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u>75</u>				
(Where applicable)				
Remarks: <u>Inclusions of upland SBW.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3							N/A	Organic	hor:Oe
3-6	10YR 2/2	100					N/A	Loam	hor:A
6-13	10YR 2/1	100					N/A	Loam	hor:B With gravel.
13-16	10YR 2/1	100					N/A	Sandy Loam	hor:B With gravel.
16-24	7.5YR 2.5/3	100					N/A	Loamy Sand	hor:B With gravel.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches): N/A	
Field Drainage Class: MWD - Moderately Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 22.0	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Saturation at 22 inches. South-facing slope. No primary hydrology indicators observed.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2031_18

	Absolute % Cover	Dominant Species?	Indicator Status
Herb			
Hierochloe alpina	2	No	NL
Carex microchaeta	1	No	FAC
Senecio lugens	1	No	FAC
Achillea millefolium s.l.	1	No	FACU
Luzula multiflora	1	No	FACU
Galium trifidum	1	No	FACW
Viola lanqsdorfii	1	No	FACW
Sapling/Shrub			
Potentilla fruticosa	2	No	FAC

Additional Reference Data: Photos

HDR2031_18



Photo Name: Photo_180623092715



Photo Name: Photo_180623084840



Photo Name: Photo_180623092702



Photo Name: Photo_180623092651



Photo Name: Photo_180623084919



Photo Name: Photo_180623092726

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/23/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2037_18</u>	
Investigators: <u>MNW, ATH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>12</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.909657</u>	Long: <u>-155.423798</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Closed Alder – Willow Tall Shrub (CAWTS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>60</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Alnus sinuata</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Salix sp.</u>	<u>45</u>	<u>Yes</u>	<u>N/A</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix pulchra</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
4. <u>Salix reticulata</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>214</u> x3= <u>642</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>91</u> x4= <u>364</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>160</u>				Column Totals: <u>305</u> (A) <u>1006</u> (B)
50% of total cover: <u>80</u>				<u>Prevalence Index = B/A=</u> <u>3.30</u>
20% of total cover: <u>32</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Gymnocarpium dryopteris</u>	<u>40</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Dryopteris expansa</u>	<u>25</u>	<u>No</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Epilobium angustifolium</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Veratrum viride</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	
7. <u>Geranium erianthum</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
8. <u>Heracleum maximum</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
9. <u>Angelica lucida</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
10. <u>Lycopodium annotinum s.l.</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>190</u>				
50% of total cover: <u>95</u>				
20% of total cover: <u>38</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1							N/A	Organic	hor:Oi
1-4							N/A	Organic	hor:Oe
4-12	7.5YR 2.5/2	100					N/A	Loam	hor:B Gravel throughout.
12-16	10YR 3/3	100					N/A	Sandy Loam	hor:B Gravel throughout.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: None	
Depth (inches): N/A	
Field Drainage Class: SED - Somewhat Excessively Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
(includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology indicators observed.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2037_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Fritillaria camschatcensis	1	No	FAC
Trientalis europaea	1	No	FACU

Additional Reference Data: Photos

HDR2037_18



Photo Name: Photo_180623131359



Photo Name: Photo_180623131343

Additional Reference Data: Photos

HDR2037_18



Photo Name: Photo_180623131253



Photo Name: Photo_180623131408



Photo Name: Photo_180623131428



Photo Name: Photo_180623131420

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/23/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2038_18</u>	
Investigators: <u>MNW, ATH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>4</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u> Lat: <u>59.908550</u>	Long: <u>-155.425232</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Open Willow Tall Shrub (OWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil X or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>2</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>3</u> x2= <u>6</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>152</u> x3= <u>456</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>9</u> x4= <u>36</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>75</u>				Column Totals: <u>164</u> (A) <u>498</u> (B)
50% of total cover: <u>37.5</u>				<u>Prevalence Index = B/A=</u> <u>3.04</u>
20% of total cover: <u>15</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Angelica lucida</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Epilobium angustifolium</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Geranium erianthum</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sanguisorba canadensis</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
7. <u>Saxifraga punctata s.l.</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Veratrum viride</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Petasites frigidus s.l.</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>89</u>				
50% of total cover: <u>44.5</u>				
20% of total cover: <u>17.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3							N/A	Organic	hor:Oe
3-6							N/A	Organic	hor:Oi
6-16	10YR 3/2	40	5YR 4/6	30	C	M	No	Loam	hor:B *3
6-16	2.5 Y 3/2	30					No	Loam	hor:B *4
16-18	2.5Y 3/2	75	5YR 4/6	25	C	M	No	Sandy Loam	hor:B
18-20	5YR 4/6						N/A	Loamy Sand	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input checked="" type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present):	
Type: None	
Depth (inches): N/A	
Field Drainage Class: SPD - Somewhat Poorly Drained	
	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks: *3: Approximately 12% of redox concentrations are on pore linings. *4: Approximately 12% of redox concentrations are on pore linings.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):	
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 2.0	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Geomorphic Position:

Additional Reference Data: Photos

HDR2038_18



Photo Name: Photo_180623143602



Photo Name: Photo_180623143532



Photo Name: Photo_180623143622

Additional Reference Data: Photos

HDR2038_18



Photo Name: Photo_180623143556



Photo Name: Photo_180623143544



Photo Name: Photo_180623143610

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	6/24/2018
Applicant/Owner:	PLP			Sampling Point:	HDR2043_18
Investigators:	MNW, ATH	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	None	Slope(%):	4	HGM:	Slope
Subregion (LRR):	X	Lat:	59.899807	Long:	-155.432236
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	PSS1B		

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)

Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation: _____ Soil X or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> X </u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			

Tree Stratum				Dominance Test Worksheet:			
Tree Stratum		Absolute % Cover	Dominant Species?	Indicator Status	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)		
1.					Total Number of Dominant Species Across All Strata: <u>3</u> (B)		
2.					Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)		
3.							
4.							
Total Cover:							
50% of total cover:		<u>0</u>	20% of total cover:	<u>0</u>			
Sapling/Shrub Stratum				Prevalence Index worksheet:			
Sapling/Shrub Stratum					Total % Cover of: <u> </u> Multiply by: <u> </u>		
1.	Alnus sinuata	80	Yes	FAC	OBL species	x1=	<u> </u>
2.	Salix pulchra	15	No	FAC	FACW species	x2=	<u> </u>
3.					FAC species	<u>200</u> x3=	<u>600</u>
4.					FACU species	<u>1</u> x4=	<u>4</u>
5.					UPL species	x5=	<u> </u>
6.					Column Totals:	<u>201</u> (A)	<u>604</u> (B)
Total Cover:		<u>95</u>			Prevalence Index = B/A= <u>3.00</u>		
50% of total cover:		<u>47.5</u>	20% of total cover:	<u>19</u>			
Herb Stratum				Hydrophytic Vegetation Indicators:			
1.	Athyrium cyclosorum	55	Yes	FAC	X	Dominance Test is >50%	
2.	Calamagrostis canadensis	35	Yes	FAC	X	Prevalence Index is ≤3.0	
3.	Equisetum sylvaticum	15	No	FAC		Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet)	
4.	Trientalis europaea	1	No	FACU		Problematic Hydrophytic Vegetation ¹ (Explain)	
5.					*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.		
6.							
7.							
8.							
9.							
10.							
Total Cover:		<u>106</u>					
50% of total cover:		<u>53</u>	20% of total cover:	<u>21.2</u>			
Plot size (radius, or length x width) <u>1/10 acre</u>			% Bare Ground	<u> </u>			
% Cover of Wetland Bryophytes <u> </u>			% Cover of Bryophytes	<u> </u>			
(Where applicable)							
					Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>		

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3								Organic	hor:Oe
3-6								Organic	hor:Oa 7% Cobble Throughout
6-8	10YR 2/2	100						Sandy Loam	hor:A
8-15	2.5Y 3/3	75	2.5YR 4/6	25	C	PL	Yes	Sandy Loam	hor:B1 10% Gravel 7% Cobble
15-23	5Y 4/2	87	5YR 4/6	10		PL	Yes	Sandy Loam	hor:B2 10 % Gravel 7% Cobble
15-23							Yes	Sandy Loam	hor:B2 10 % Gravel 7% Cobble
15-23			7.5YR 5/8	3	C	PL	Yes	Sandy Loam	hor:B2 10 % Gravel 7% Cobble

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:

☐ Histosol or Histel (A1)

☐ Histic Epipedon (A2)

☐ Hydrogen Sulfide (A4)

☐ Thick Dark Surface (A12)

☐ Alaska Gleyed (A13)

☐ Alaska Redox (A14)

☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:

☐ Alaska Color Change (TA4)⁴

☐ Alaska Alpine Swales (TA5)

☒ Alaska Redox With 2.5Y Hue

☐ Alaska Gleyed Without Hue 5Y or Redder

☐ Underlying Layer

☐ Other (Explain in Remarks)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

Restrictive Layer (if present):
Type: None
Depth (inches): N/A
Field Drainage Class: PD - Poorly Drained

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)

☐ Surface Water (A1)

☐ High Water Table (A2)

☒ Saturation (A3)

☐ Water Marks (B1)

☐ Sediment Deposits (B2)

☐ Drift Deposits (B3)

☐ Algal Mat or Crust (B4)

☐ Iron Deposits (B5)

☐ Surface Soil Cracks (B6)

☐ Inundation Visible on Aerial Imagery (B7)

☐ Sparsely Vegetated Concave Surface (B8)

☐ Marl Deposits (B15)

☐ Hydrogen Sulfide Odor (C1)

☐ Dry Season Water Table (C2)

☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

☐ Water-stained Leaves (B9)

☐ Drainage Patterns (B10)

☐ Oxidized Rhizospheres along Living Roots (C3)

☒ Presence of Reduced Iron (C4)

☐ Salt Deposits (C5)

☐ Stunted or Stressed Plants (D1)

☐ Geomorphic Position (D2)

☐ Shallow Aquitard (D3)

☐ Microtopographic Relief (D4)

☐ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ☐ No ☒ Depth (inches):
Water Table Present? Yes ☒ No ☐ Depth (inches):
Saturation Present? Yes ☒ No ☐ Depth (inches): 11.0
(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water table depth measurement not available, however pit photos show water ponding in the pit at 20 inches.

Geomorphic Position:

Additional Reference Data: Photos

HDR2043_18



Photo Name: Photo_180624085439



Photo Name: Photo_180624085529



Photo Name: Photo_180624085649

Additional Reference Data: Photos

HDR2043_18



Photo Name: Photo_180624085541



Photo Name: Photo_180624085502



Photo Name: Photo_180624085550

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/24/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2046_18</u>	
Investigators: <u>MNW, ATH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>10</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.898037</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1C</u>	

Vegetation Type: Closed Alder – Willow Tall Shrub (CAWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>80</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Alnus sinuata</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>11</u> x2= <u>22</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>160</u> x3= <u>480</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>18</u> x4= <u>72</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>189</u> (A) <u>574</u> (B)
Total Cover: <u>110</u>				<u>Prevalence Index = B/A=</u> <u>3.04</u>
50% of total cover: <u>55</u>				
20% of total cover: <u>22</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Dryopteris expansa</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
5. <u>Geranium erianthum</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Trientalis europaea</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
7. <u>Viola langsdorffii</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>79</u>				
50% of total cover: <u>39.5</u>				
20% of total cover: <u>15.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>15</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>40</u>				Present?
(Where applicable)				

Remarks:
Small patch of alder, but mostly willow.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-5							N/A		hor:Oi
5-20							N/A		hor:Oe

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type:	None		Yes	<input checked="" type="checkbox"/> X	No
Depth (inches):	N/A				
Field Drainage Class:	PD - Poorly Drained				

Remarks: Iron floc and oily sheen seen in nearby surface water.

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input checked="" type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)		
<input type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Water Marks (B1)		<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input checked="" type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	1.0	
Water Table Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	20.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	8.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Original hydrology measurements unavailable. Based on site photos, water table at the site was estimated to be 20 inches; saturation was estimated to be 8 inches. Water appears to be seeping in at 13 inches. Iron floc and oily sheen seen in nearby surface water.
Geomorphic Position:

Additional Reference Data: Photos

HDR2046_18



Photo Name: Photo_180624121621



Photo Name: Photo_180624121527



Photo Name: Photo_180624122544

Additional Reference Data: Photos

HDR2046_18



Photo Name: Photo_180624122553



Photo Name: Photo_180624122600



Photo Name: Photo_180624121514



Photo Name: Photo_180624122536

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/24/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2047_18</u>	
Investigators: <u>MNW, ATH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>4</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.897587</u>	Long: <u>-155.429871</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Closed Alder – Willow Tall Shrub (CAWTS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>6</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>67</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Alnus sinuata</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Salix pulchra</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>2</u> x2= <u>4</u>
3. <u>Viburnum edule</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	FAC species <u>129</u> x3= <u>387</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>46</u> x4= <u>184</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>177</u> (A) <u>575</u> (B)
Total Cover: <u>90</u>				<u>Prevalence Index = B/A=</u> <u>3.25</u>
50% of total cover: <u>45</u>				
20% of total cover: <u>18</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Athyrium cyclosum</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Gymnocarpium dryopteris</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Heracleum maximum</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Angelica lucida</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Geranium erianthum</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
7. <u>Thelypteris phegopteris</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Veratrum viride</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Epilobium angustifolium</u>	<u>4</u>	<u>No</u>	<u>FACU</u>	
10. <u>Sanguisorba canadensis</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>87</u>				Hydrophytic
50% of total cover: <u>43.5</u>				Vegetation
20% of total cover: <u>17.4</u>				Yes <u>X</u> No <u> </u>
Plot size (radius, or length x width) <u>1/10 acre</u>				Present?
% Bare Ground <u>25</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes <u>0</u>				
(Where applicable)				
Remarks:				
CAWTS				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2							N/A	Organic	hor:Oe
2-3	10YR 2/2	100					N/A	Loam	hor:A
3-12	7.5YR 2.5/3	100					N/A	Sandy Loam	hor:B 5% gravel.
12-24	7.5YR 4/4	100					N/A	Loamy Sand	hor:B/C 5% gravel.

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X
Type: None	
Depth (inches): N/A	
Field Drainage Class: MWD - Moderately Well Drained	

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches): (includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No water table or saturation observed. No primary hydrology indicators observed.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Mertensia paniculata	1	No	FACU
Streptopus amplexifolius	1	No	FACU

Additional Reference Data: Photos

HDR2047_18



Photo Name: Photo_180624135847



Photo Name: Photo_180624135712



Photo Name: Photo_180624135738

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/24/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2049_18</u>	
Investigators: <u>MNW, ATH</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>12</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.898079</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>U</u>	

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
Sapling/Shrub Stratum				Prevalence Index worksheet: <u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u> OBL species <u> </u> x1= <u> </u> FACW species <u>14</u> x2= <u>28</u> FAC species <u>135</u> x3= <u>405</u> FACU species <u>18</u> x4= <u>72</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>167</u> (A) <u>505</u> (B) <i>Prevalence Index = B/A=</i> <u>3.02</u>
1. <u>Salix pulchra</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>70</u>				
50% of total cover: <u>35</u>		20% of total cover: <u>14</u>		
Herb Stratum				Hydrophytic Vegetation Indicators: <u>X</u> Dominance Test is >50% <u> </u> Prevalence Index is ≤3.0 <u> </u> Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Calamagrostis canadensis</u>	<u>45</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Equisetum arvense</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	
4. <u>Gymnocarpium dryopteris</u>	<u>4</u>	<u>No</u>	<u>FACU</u>	
5. <u>Heracleum maximum</u>	<u>4</u>	<u>No</u>	<u>FACU</u>	
6. <u>Viola langsdorffii</u>	<u>4</u>	<u>No</u>	<u>FACW</u>	
7. <u>Equisetum sylvaticum</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
8. <u>Veratrum viride</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
9. <u>Chamaenerion angustifolium</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
10. <u>Galium boreale</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>97</u>				
50% of total cover: <u>48.5</u>		20% of total cover: <u>19.4</u>		
Plot size (radius, or length x width) <u>1/10 acre</u>		% Bare Ground <u>0</u>		
% Cover of Wetland Bryophytes <u>0</u>		% Cover of Bryophytes <u>60</u>		
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4							N/A	Organic	hor:Oe
4-5							N/A	Organic	hor:Oa
5-8	10YR 2/2	100					No	Loam	hor:A
8-14	7.5YR 4/4	100					No	Loam	hor:B1
14-20	10YR 3/2	25					N/A	Sandy Loam	hor:B2
14-20	10YR 4/6	75					N/A	Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present):	
Type: None	
Depth (inches): N/A	
Field Drainage Class: MWD - Moderately Well Drained	
	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-stained Leaves (B9)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Microtopographic Relief (D4)
	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):	
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 8.0	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2049_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Geranium erianthum	2	No	FACU
Lupinus nootkatensis	2	No	FACU
Mertensia paniculata	2	No	FACU
Aconitum delphiniifolium	1	No	FAC
Anemone richardsonii	1	No	FAC
Carex podocarpa	1	No	FAC
Festuca altaica	1	No	FAC
Fritillaria camschatcensis	1	No	FAC
Valeriana capitata	1	No	FAC

Additional Reference Data: Photos

HDR2049_18



Photo Name: Photo_180624154016



Photo Name: Photo_180624154149



Photo Name: Photo_180624154143



Photo Name: Photo_180624154135



Photo Name: Photo_180624154058



Photo Name: Photo_180624154128

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/7/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2050_18</u>	
Investigators: <u>MW AG</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>7</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.902706</u>	Long: <u>-155.394363</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
NW1 Classification: <u>U</u>		

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If No, explain in Remarks)

Are Vegetation: ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation: ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Remarks: Wetter than normal antecedent precipitation		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>4</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Vaccinium uliginosum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u>1</u> <u>multiply by:</u> <u>1</u>
2. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	OBL species <u>1</u> x1= <u>1</u>
3. <u>Salix reticulata</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>12</u> x2= <u>24</u>
4. <u>Spiraea beauverdiana</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	FAC species <u>97</u> x3= <u>291</u>
5. _____	_____	_____	_____	FACU species <u>17</u> x4= <u>68</u>
6. _____	_____	_____	_____	UPL species _____ x5= _____
Total Cover: <u>36</u>				Column Totals: <u>127</u> (A) <u>384</u> (B)
50% of total cover: <u>18</u>				<u>Prevalence Index = B/A=</u> <u>3.02</u>
20% of total cover: <u>7.2</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<input checked="" type="checkbox"/> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<input type="checkbox"/> Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	<input type="checkbox"/> Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Angelica lucida</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Epilobium angustifolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
7. <u>Sedum rosea ssp. integrifolium</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Valeriana capitata</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Anemone narcissiflora</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
10. <u>Lupinus nootkatensis</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>93</u>				
50% of total cover: <u>46.5</u>				
20% of total cover: <u>18.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u>50</u>				
(Where applicable)				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks:				
Very diverse sloping terrace with slight hummocks				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-4									hor:Oe
4-16	10 YR 3/3	100					No	Fine Sandy Loam	hor:B1
16-20	10YR 3/6	100					No	Fine Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X
Type: None observed		
Depth (inches):		
Field Drainage Class: MWD - Moderately Well Drained		

Remarks: No indicators. Cobbles starting at 4 inches

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):		
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):		
Saturation Present? Yes <input checked="" type="checkbox"/> X No <input type="checkbox"/> Depth (inches): 20.0		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary indicators. Damp at 14"

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2050_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Rubus chamaemorus	2	No	FACW
Arnica sp.	2	No	N/A
Cornus suecica	1	No	FAC
Luzula parviflora	1	No	FAC
Polygonum viviparum	1	No	FAC
Luzula multiflora	1	No	FACU
Trientalis europaea	1	No	FACU
Montia chamissoi	1	No	OBL

Additional Reference Data: Photos

HDR2050_18



Photo Name: Photo_180707092101



Photo Name: Photo_180707092035

Additional Reference Data: Photos

HDR2050_18



Photo Name: Photo_180707092108



Photo Name: Photo_180707092054



Photo Name: Photo_180707092046

Photo Name: Photo_180707091901



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/7/2018
 Applicant/Owner: PLP Sampling Point: HDR2051_18
 Investigators: MNW AG Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 5 HGM: Slope
 Subregion (LRR): X Lat: 59.903408 Long: -155.394714 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PEM1/SS1C

Vegetation Type: Open Willow Low Shrub Fen (OWLSF)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	60	Yes	FAC	OBL species <u>10</u> x1= <u>10</u>
2. <u>Empetrum nigrum</u>	10	No	FAC	FACW species <u>6</u> x2= <u>12</u>
3. <u>Salix reticulata</u>	10	No	FAC	FAC species <u>187</u> x3= <u>561</u>
4. <u>Vaccinium uliginosum</u>	10	No	FAC	FACU species <u>2</u> x4= <u>8</u>
5. <u>Spiraea beauverdiana</u>	2	No	FACU	UPL species <u>1</u> x5= <u>5</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>206</u> (A) <u>596</u> (B)
Total Cover: <u>92</u>				<u>Prevalence Index = B/A=</u> <u>2.89</u>
50% of total cover: <u>46</u>				
20% of total cover: <u>18.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	60	Yes	FAC	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	25	Yes	FAC	<u>X</u> Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	10	No	FAC	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Comarum palustre</u>	5	No	OBL	<u> </u> data in Remarks or on a separate sheet)
5. <u>Eriophorum angustifolium</u>	5	No	OBL	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sedum rosea ssp. integrifolium</u>	2	No	FAC	
7. <u>Carex membranacea</u>	2	No	FACW	¹ Indicators of hydric soil and wetland hydrology
8. <u>Rumex arcticus</u>	2	No	FACW	must be present, unless disturbed or problematic.
9. <u>Pedicularis langsдорфii</u>	1	No	FACW	
10. <u>Petasites frigidus s.l.</u>	1	No	FACW	
Total Cover: <u>114</u>				
50% of total cover: <u>57</u>				
20% of total cover: <u>22.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>70</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>80</u>				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-8							No		hor:Oi
8-12							Yes		hor:Oe
12-16	5YR4/2	60	10YR4/6	40	C	M RC	Yes	Fine Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input checked="" type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: _____		
Depth (inches): _____		
Field Drainage Class: VPD - Very Poorly Drained		

Remarks: Blocky, angular cobbles at 10"

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input checked="" type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): 3.0	
Water Table Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): 2.0	
Saturation Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): 0.0	
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
H2S at 8", positive reactions to alpha alpha.

Geomorphic Position: Terrace on hillslope

Additional Reference Data: Overflow Vegetation

HDR2051_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Primula eximia	1	No	NL

Additional Reference Data: Photos

HDR2051_18



Photo Name: Photo_180707101617



Photo Name: Photo_180707101649

Additional Reference Data: Photos

HDR2051_18



Photo Name: Photo_180707101741



Photo Name: Photo_180707101658



Photo Name: Photo_180707101715



Photo Name: Photo_180707101600

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/7/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2054_18</u>	
Investigators: <u>MNW AG</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): _____	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.904083</u>	Long: <u>-155.395477</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
NW1 Classification: <u>U</u>		

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)

Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>		
Wetland Hydrology Present? Yes <u>X</u> No _____		
Remarks: Wetter than normal antecedent precipitation		

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x1= _____ FACW species _____ x2= _____ FAC species <u>172</u> x3= <u>516</u> FACU species <u>4</u> x4= <u>16</u> UPL species <u>1</u> x5= <u>5</u> Column Totals: <u>177</u> (A) <u>537</u> (B) Prevalence Index = B/A= <u>3.03</u>
50% of total cover: <u>0</u>	_____	20% of total cover: <u>0</u>	_____	
Sapling/Shrub Stratum				
1. <u>Empetrum nigrum</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Vaccinium uliginosum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Salix reticulata</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	
4. <u>Dryas integrifolia</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
5. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: X Dominance Test is >50% Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
6. _____	_____	_____	_____	
Total Cover: <u>147</u>	_____	_____	_____	
50% of total cover: <u>73.5</u>	_____	20% of total cover: <u>29.4</u>	_____	
Herb Stratum				
1. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Carex bigelowii</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Equisetum arvense</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
4. <u>Festuca altaica</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
5. <u>Anemone narcissiflora</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
6. <u>Pedicularis sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	
7. <u>Lagotis glauca s.l.</u>	<u>1</u>	<u>No</u>	<u>NL</u>	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>31</u>	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
50% of total cover: <u>15.5</u>	_____	20% of total cover: <u>6.2</u>	_____	
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u> % Cover of Wetland Bryophytes _____ % Cover of Bryophytes _____ (Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1								Fine Sandy Loam	hor:Oi
1-3	10YR 3/3	100					No	Fine Sandy Loam	hor:B1
3-4									hor:Oe
4-8	10YR 3/4	100					No	Sandy Loam	hor:B2
8-18	10YR 3/6	100					No	Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: _____					
Depth (inches): _____					
Field Drainage Class: MWD - Moderately Well Drained					

Remarks: No indicators

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)		
<input type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input type="checkbox"/> FAC-Neutral Test (D5)		
Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	No	X	Depth (inches):	
Water Table Present?	Yes	No	X	Depth (inches):	
Saturation Present?	Yes	X	No	Depth (inches):	10.0
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Saturation between 10 and 14" (possibly episaturation, but no relatively impermeable layers noted in original field data for soils). No primary indicators.

Geomorphic Position:



Photo Name: Photo_180707114215



Photo Name: Photo_180707114153



Photo Name: Photo_180707114108

Additional Reference Data: Photos

HDR2054_18



Photo Name: Photo_180707114117



Photo Name: Photo_180707114205



Photo Name: Photo_180707114146

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/7/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2058_18</u>	
Investigators: <u>MNW AG</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): _____	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.904171</u>	Long: <u>-155.399033</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Open Willow Low Shrub Fen (OWLSF)</u>		NWI Classification: <u>PEM1/SS1C</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)

Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No _____
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes <u>X</u>	No _____			
Remarks: Wetter than normal antecedent precipitation.					

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>5</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>80</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix reticulata</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> _____ <u>Multiply by:</u> _____
2. <u>Spiraea stevenii</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	OBL species <u>6</u> x1= <u>6</u>
3. <u>Vaccinium uliginosum</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>20</u> x2= <u>40</u>
4. _____	_____	_____	_____	FAC species <u>151</u> x3= <u>453</u>
5. _____	_____	_____	_____	FACU species <u>19</u> x4= <u>76</u>
6. _____	_____	_____	_____	UPL species <u>1</u> x5= <u>5</u>
Total Cover: <u>40</u>				Column Totals: <u>197</u> (A) <u>580</u> (B)
50% of total cover: <u>20</u>				<u>Prevalence Index = B/A=</u> <u>2.94</u>
20% of total cover: <u>8</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	<u>55</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>30</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet)
4. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	
5. <u>Comarum palustre</u>	<u>5</u>	<u>No</u>	<u>OBL</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Cerastium beeringianum</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
7. <u>Sedum rosea ssp. integrifolium</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
8. <u>Epilobium angustifolium</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
9. <u>Epilobium hornemannii</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
10. <u>Petasites frigidus s.l.</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>161</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
50% of total cover: <u>80.5</u>				
20% of total cover: <u>32.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Cover of Wetland Bryophytes <u>20</u>				
% Cover of Bryophytes <u>90</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-9									hor:Oa
9-14	2.5Y 4/2	75	7.5YR 4/6	25	C	PL RC	No	Fine Sandy Loam	hor:B *3

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/>	No
Type:					
Depth (inches):					
Field Drainage Class:					

Remarks: *3: Cobbles starting at 5". Could not dig below 14" due to large cobbles.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/>	No
Surface Water Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 3.0				
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 7.0				
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Small seeps that saturate a rock lined plateau and then go subsurface. Seeps with pools.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2058_18

	Absolute % Cover	Dominant Species?	Indicator Status
Herb			
Rubus chamaemorus	2	No	FACW
Rumex arcticus	2	No	FACW
Epilobium sp.	2	No	N/A
Aconitum delphiniifolium	1	No	FAC
Cornus suecica	1	No	FAC
Listera borealis	1	No	FACU
Luzula multiflora	1	No	FACU
Juncus castaneus	1	No	FACW
Platanthera obtusata	1	No	FACW
Carex sp.	1	No	N/A
Pedicularis sp.	1	No	N/A
Minuartia macrocarpa	1	No	NL
Eriophorum chamissonis s.l.	1	No	OBL

Additional Reference Data: Photos

HDR2058_18



Photo Name: Photo_180707134158



Photo Name: Photo_180707134323

Additional Reference Data: Photos

HDR2058_18



Photo Name: Photo_180707134219



Photo Name: Photo_180707134310



Photo Name: Photo_180707134303



Photo Name: Photo_180707134250

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/7/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2059_18</u>	
Investigators: <u>MNW AG</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>7</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.904316</u>	Long: <u>-155.401138</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Closed Willow Low Shrub (CWLS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: Mapped small drainage through polygon. <1' wide. Wetter than normal antecedent precipitation	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>95</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>10</u> x2= <u>20</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>108</u> x3= <u>324</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>9</u> x4= <u>36</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>100</u>				Column Totals: <u>127</u> (A) <u>380</u> (B)
50% of total cover: <u>50</u>				<u>Prevalence Index = B/A=</u> <u>2.99</u>
20% of total cover: <u>20</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Dominance Test is >50%
2. <u>Athyrium americanum</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Epilobium angustifolium</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Lycopodium sp.</u>	<u>2</u>	<u>No</u>	<u>N/A</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Equisetum arvense</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Veratrum viride</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
8. <u>Viola epipsila</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
9. <u>Listera borealis</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
10. <u>Trientalis europaea</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>29</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>14.5</u>				
20% of total cover: <u>5.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>15</u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u>0</u> (Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-6									hor:Oe
6-7	10 YR 3/3	100						Silt Loam	hor:B1
7-16	10YR 4/2	95	10YR 4/6	5	C	M	No	Silt Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:
☐ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:
☐ Alaska Color Change (TA4)⁴
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox With 2.5Y Hue

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

☐ Alaska Gleyed Without Hue 5Y or Redder
☐ Underlying Layer
☐ Other (Explain in Remarks)

Restrictive Layer (if present):
Type: _____
Depth (inches): _____
Field Drainage Class: _____

Hydric Soil Present? Yes No ☒ X

Remarks: No indicators

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)
☐ Surface Water (A1)
☐ High Water Table (A2)
☐ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Marl Deposits (B15)
☐ Hydrogen Sulfide Odor (C1)
☐ Dry Season Water Table (C2)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)
☐ Water-stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ Microtopographic Relief (D4)
☒ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes No ☒ X Depth (inches): _____
Water Table Present? Yes No ☒ X Depth (inches): _____
Saturation Present? Yes No ☒ X Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes No ☒ X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary indicators

Geomorphic Position:



Photo Name: Photo_180707145101



Photo Name: Photo_180707145017



Photo Name: Photo_180707145054



Photo Name: Photo_180707145046



Photo Name: Photo_180707145106



Photo Name: Photo_180707144943

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/7/2018
 Applicant/Owner: PLP Sampling Point: HDR2061_18
 Investigators: MNW AG Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 4 HGM: N/A
 Subregion (LRR): X Lat: 59.903503 Long: -155.403336 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>			
Remarks: No evidence of ponding. Wetter than normal antecedent precipitation.					

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Vaccinium uliginosum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
4. <u>Ledum decumbens</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FAC species <u>144</u> x3= <u>432</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>3</u> x4= <u>12</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u>2</u> x5= <u>10</u>
Total Cover: <u>112</u>				Column Totals: <u>149</u> (A) <u>454</u> (B)
50% of total cover: <u>56</u>				Prevalence Index = B/A= <u>3.05</u>
20% of total cover: <u>22.4</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Betula nana</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Cornus suecica</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Festuca altaica</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sedum rosea ssp. integrifolium</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
7. <u>Valeriana capitata</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
8. <u>Angelica lucida</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
9. <u>Lupinus nootkatensis</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
10. <u>Trientalis europaea</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>38</u>				
50% of total cover: <u>19</u>				
20% of total cover: <u>7.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-4									hor:Oe
4-18	10YR 3/3	85	7.5YR3/3	15	C	M RC	No	Fine Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: _____					
Depth (inches): _____					
Field Drainage Class: WD - Well Drained					

Remarks: No indicators

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	No	X
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches): _____				
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches): _____				
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches): _____				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary indicators

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2061_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Artemisia sp	1	No	N/A
Arnica frigid	1	No	NL
Lagotis glauca s.l.	1	No	NL

Additional Reference Data: Photos

HDR2061_18



Photo Name: Photo_180707154333



Photo Name: Photo_180707154323

Additional Reference Data: Photos

HDR2061_18



Photo Name: Photo_180707154340



Photo Name: Photo_180707154252



Photo Name: Photo_180707154314

Photo Name: Photo_180707154234



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/8/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2063_18</u>	
Investigators: <u>MW AG</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): _____	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.888924</u>	Long: <u>-155.401794</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)

Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>		
Wetland Hydrology Present? Yes <u>X</u> No _____		
Remarks: Thin band of DEST-H at point, much more Cal can in surrounding areas. Wetter than normal antecedent precipitation		

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>5</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>80</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Vaccinium uliginosum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> _____ <u>Multiply by:</u> _____
2. <u>Empetrum nigrum</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>1</u> x1= <u>1</u>
3. <u>Andromeda polifolia</u>	<u>15</u>	<u>No</u>	<u>FACW</u>	FACW species <u>25</u> x2= <u>50</u>
4. <u>Salix reticulata</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FAC species <u>112</u> x3= <u>336</u>
5. <u>Salix pulchra</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	FACU species <u>5</u> x4= <u>20</u>
6. <u>Vaccinium vitis-idaea</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	UPL species <u>8</u> x5= <u>40</u>
Total Cover: <u>95</u>				Column Totals: <u>151</u> (A) <u>447</u> (B)
50% of total cover: <u>47.5</u>				<u>Prevalence Index = B/A=</u> <u>2.96</u>
20% of total cover: <u>19</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex microchaeta</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Lagotis glauca s.l.</u>	<u>8</u>	<u>Yes</u>	<u>NL</u>	Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>7</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Anemone narcissiflora</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
7. <u>Rubus arcticus s.l.</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Sedum rosea ssp. integrifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Veratrum viride</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u>Primula cuneifolia</u>	<u>1</u>	<u>No</u>	<u>OBL</u>	
Total Cover: <u>56</u>				
50% of total cover: <u>28</u>				
20% of total cover: <u>11.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>5</u>				
% Cover of Bryophytes <u>15</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-7									hor:Oe
7-12	10YR2/2	100					No	Sandy Loam	hor:A
12-20	10YR4/6	100					No	Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X
Type: None		
Depth (inches):		
Field Drainage Class: MWD - Moderately Well Drained		

Remarks: Cobbles starting 7". Water in microlow downstream of pit became turbid with sediment after hole was dug - indicates water is moving through soil quickly.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 2.0		
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 2.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Raining heavily. Hydro likely due to precip. Vac uli, Emp nig, lichen in flooded micro lows.

Geomorphic Position: Toeslope

Additional Reference Data: Photos

HDR2063_18

Photo Name: Photo_180708084158



Photo Name: Photo_180708084146



Photo Name: Photo_180708084058



Additional Reference Data: Photos

HDR2063_18



Photo Name: Photo_180708084108



Photo Name: Photo_180708084138



Photo Name: Photo_180708084152

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/8/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2064_18</u>	
Investigators: <u>MNW AG</u>	Landform (hillslope, terrace, etc.): <u>Footslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>2</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.889156</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PEM1/SS1B</u>	

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil X or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>	
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>45</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u>
2. <u>Empetrum nigrum</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Betula nana</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACW species <u>43</u> x2= <u>86</u>
4. <u>Spiraea beauverdiana</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	FAC species <u>124</u> x3= <u>372</u>
5. <u>Salix reticulata</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>17</u> x4= <u>68</u>
6. <u>Vaccinium vitis-idaea</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>86</u>				Column Totals: <u>184</u> (A) <u>526</u> (B)
50% of total cover: <u>43</u>				<u>Prevalence Index = B/A=</u> <u>2.86</u>
20% of total cover: <u>17.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Sanguisorba canadensis</u>	<u>40</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Carex bigelowii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Sedum rosea ssp. integrifolium</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Anemone narcissiflora</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Viola epipsila</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Equisetum arvense</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
8. <u>Valeriana capitata</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
9. <u>Angelica lucida</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
10. <u>Rubus chamaemorus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>98</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>49</u>				
20% of total cover: <u>19.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>25</u> % Cover of Bryophytes <u>65</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-7									hor:Oe
7-14	2.5Y 4/2	90	10YR 4/6	10	C	RC	No	Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input checked="" type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: SPD - Somewhat Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
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Remarks: 90% large (8"+) cobbles throughout B layer.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	<input type="checkbox"/> Water-stained Leaves (B9)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): 2.0 Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): 6.0 Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): 2.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Raining heavily.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2064_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Anemone richardsonii	1	No	FAC
Petasites frigidus s.l.	1	No	FACW

Additional Reference Data: Photos

HDR2064_18



Photo Name: Photo_180708092510



Photo Name: Photo_180708092553



Photo Name: Photo_180708092625



Photo Name: Photo_180708092616



Photo Name: Photo_180708092607

Additional Reference Data: Photos

HDR2064_18

Photo Name: Photo_180708092457



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/8/2018
 Applicant/Owner: PLP Sampling Point: HDR2065_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Valleybottom
 Local Relief (concave, convex, none): Concave Slope(%): 6 HGM: N/A
 Subregion (LRR): X Lat: 59.888458 Long: -155.401230 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Narrow band of Sal pul and Cal can adjacent to stream. Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>2</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Prevalence Index worksheet:				
<u>Sapling/Shrub Stratum</u>		Total % Cover of: <u> </u> Multiply by:		
1. <u>Salix pulchra</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Spiraea beauverdiana</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	FACW species <u>16</u> x2= <u>32</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>119</u> x3= <u>357</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>29</u> x4= <u>116</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>164</u> (A) <u>505</u> (B)
Total Cover: <u>35</u>				Prevalence Index = B/A= <u>3.08</u>
50% of total cover: <u>17.5</u>				
20% of total cover: <u>7</u>				
Hydrophytic Vegetation Indicators:				
<u>Herb Stratum</u>				X Dominance Test is >50%
1. <u>Calamagrostis canadensis</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
2. <u>Angelica lucida</u>	<u>15</u>	<u>No</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
3. <u>Sanguisorba canadensis</u>	<u>15</u>	<u>No</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
4. <u>Carex podocarpa</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
5. <u>Dryopteris expansa</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
6. <u>Rubus arcticus s.l.</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
7. <u>Veratrum viride</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
8. <u>Viola epipsila</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
9. <u>Trientalis europaea</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
10. <u>Aconitum delphinifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>129</u>				
50% of total cover: <u>64.5</u>				
20% of total cover: <u>25.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				% Bare Ground <u>0</u>
% Cover of Wetland Bryophytes <u>0</u>		% Cover of Bryophytes ⁵ <u> </u>		
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-5									hor:Oe
5-12	10YR2/1	75	10YR3/2	25	C	M	No	Sandy Loam	hor:B1
12-18	7.5YR2.5/2	100					No	Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		
Type: _____		
Depth (inches): _____		
Field Drainage Class: SPD - Somewhat Poorly Drained		
	Hydric Soil Present?	Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Remarks: Cobbles below 5".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input type="checkbox"/> X <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0		
Saturation Present? Yes <input type="checkbox"/> X <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0		
(includes capillary fringe)		
	Wetland Hydrology Present?	Yes <input type="checkbox"/> X <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Heavy rain.

Geomorphic Position: Adj to stream, valley bottom

Additional Reference Data: Overflow Vegetation

HDR2065_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Anemone richardsonii	1	No	FAC
Polemonium acutiflorum	1	No	FAC
Saxifraga punctata s.l.	1	No	FAC
Valeriana capitata	1	No	FAC
Geranium erianthum	1	No	FACU
Senecio trianquularis	1	No	FACW

Additional Reference Data: Photos

HDR2065_18



Photo Name: Photo_180708101401



Photo Name: Photo_180708101324



Photo Name: Photo_180708101354



Photo Name: Photo_180708101333



Photo Name: Photo_180708101348



Photo Name: Photo_180708101342

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/8/2018
 Applicant/Owner: PLP Sampling Point: HDR2066_18
 Investigators: MNW AG Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 8 HGM: N/A
 Subregion (LRR): X Lat: 59.888256 Long: -155.399185 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>		
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>		

Remarks: Plot near incised channel. The bottom of the channel is vegetated. Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Prevalence Index worksheet:				
<u>Sapling/Shrub Stratum</u>		Total % Cover of: <u> </u> Multiply by:		
1. <u>Empetrum nigrum</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Salix reticulata</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACW species <u>3</u> x2= <u>6</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>130</u> x3= <u>390</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>11</u> x4= <u>44</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u>2</u> x5= <u>10</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>146</u> (A) <u>450</u> (B)
Total Cover: <u>85</u>				Prevalence Index = B/A= <u>3.08</u>
50% of total cover: <u>42.5</u>				
20% of total cover: <u>17</u>				
Hydrophytic Vegetation Indicators:				
1. <u>Calamagrostis canadensis</u>				<u>X</u> Dominance Test is >50%
2. <u>Festuca altaica</u>				Prevalence Index is ≤3.0
3. <u>Carex microchaeta</u>				Morphological Adaptations ¹ (Provide
4. <u>Anemone narcissiflora</u>				data in Remarks or on a separate sheet)
5. <u>Ranunculus sp.</u>				Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sedum rosea ssp. integrifolium</u>				
7. <u>Valeriana capitata</u>				
8. <u>Angelica lucida</u>				
9. <u>Galium boreale</u>				
10. <u>Sanguisorba canadensis</u>				
Total Cover: <u>63</u>				
50% of total cover: <u>31.5</u>				
20% of total cover: <u>12.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				% Bare Ground <u>0</u>
% Cover of Wetland Bryophytes <u>0</u>		% Cover of Bryophytes <u>25</u>		
(Where applicable)				

Remarks:
 Yellow ranunculus growing in bottom of channel with other forbs and grass. Ranunculus collected.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-3									hor:Oe
3-4	10YR 3/4	100					N/A	Fine Sandy Loam	hor:B1
4-7							N/A	Silt Loam	hor:Oe
7-8	10YR 3/2	100					N/A	Silt Loam	hor:B2
8-20	10YR 4/3	100					N/A	Silt Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		
Type: _____		
Depth (inches): _____		
Field Drainage Class: MWD - Moderately Well Drained		
	Hydric Soil Present?	Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Remarks: No indicators. Cobbles starting 6 inches.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		
	Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No water or saturation observed.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2066_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Athyrium americanum	1	No	FAC
Senecio lugens	1	No	FAC
Viola epipsila	1	No	FAC
Luzula multiflora	1	No	FACU
Trientalis europaea	1	No	FACU
Rubus chamaemorus	1	No	FACW
Artemisia arctica	1	No	NL
Laqotis qlauca s.l.	1	No	NL

Additional Reference Data: Photos

HDR2066_18



Photo Name: Photo_180708105623



Photo Name: Photo_180708105340

Additional Reference Data: Photos

HDR2066_18



Photo Name: Photo_180708105619



Photo Name: Photo_180708105600



Photo Name: Photo_180708110751

Additional Reference Data: Photos

HDR2066_18



Photo Name: Photo_180708110728



Photo Name: Photo_180708105538



Photo Name: Photo_180708105609

Additional Reference Data: Photos

HDR2066_18

Photo Name: Photo_180708110739



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/8/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2067_18</u>	
Investigators: <u>MW AG</u>	Landform (hillslope, terrace, etc.): <u>Hillside</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>7</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.888676</u>	Long: <u>-155.396637</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra (DEST)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: Wetter than normal antecedent precipitation.	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>6</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>9</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>67</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Vaccinium uliginosum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix reticulata</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACW species <u>1</u> x2= <u>2</u>
4. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>143</u> x3= <u>429</u>
5. <u>Dryas octopetala</u>	<u>5</u>	<u>No</u>	<u>NL</u>	FACU species <u>2</u> x4= <u>8</u>
6. <u>Salix pulchra</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	UPL species <u>12</u> x5= <u>60</u>
Total Cover: <u>121</u>				Column Totals: <u>158</u> (A) <u>499</u> (B)
50% of total cover: <u>60.5</u>				<u>Prevalence Index = B/A=</u> <u>3.16</u>
20% of total cover: <u>24.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex microchaeta</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Festuca altaica</u>	<u>3</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Rubus arcticus s.l.</u>	<u>3</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Senecio lugens</u>	<u>3</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Ranunculus sp.</u>	<u>3</u>	<u>Yes</u>	<u>N/A</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Artemisia arctica</u>	<u>3</u>	<u>Yes</u>	<u>NL</u>	
7. <u>Lagotis glauca s.l.</u>	<u>3</u>	<u>Yes</u>	<u>NL</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Polygonum viviparum</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Sedum rosea ssp. integrifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u>Valeriana capitata</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>40</u>				
50% of total cover: <u>20</u>				
20% of total cover: <u>8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes ⁵ <u> </u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-4									hor:Oe
4-8	10YR2/2	100						Silt Loam	hor:A
8-16	7.5 YR2.5/2	100						Silt Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: _____	
Depth (inches): _____	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Field Drainage Class: MWD - Moderately Well Drained	

Remarks: Cobbles and gravels present in A and B layers.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
(includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary hydrology indicators observed. Hummocks present.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2067_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Angelica lucida	1	No	FACU
Polygonum bistorta ssp. plumosum	1	No	FACU
Sanquisorba canadensis	1	No	FACW
Arnica lessingii	1	No	NL

Additional Reference Data: Photos

HDR2067_18



Photo Name: Photo_180708123354



Photo Name: Photo_180708123302

Additional Reference Data: Photos

HDR2067_18



Photo Name: Photo_180708123400



Photo Name: Photo_180708123339



Photo Name: Photo_180708123313



Photo Name: Photo_180708123347

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/8/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2068_18</u>	
Investigators: <u>MW AG</u>	Landform (hillslope, terrace, etc.): <u>Valleybottom</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>4</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.886623</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PEM1/SS1B</u>	

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
Sapling/Shrub Stratum				Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: OBL species <u> </u> x1= <u> </u> FACW species <u>15</u> x2= <u>30</u> FAC species <u>126</u> x3= <u>378</u> FACU species <u>6</u> x4= <u>24</u> UPL species <u>1</u> x5= <u>5</u> Column Totals: <u>148</u> (A) <u>437</u> (B) Prevalence Index = B/A= <u>2.95</u>
1. <u>Salix pulchra</u>	<u>55</u>	<u>Yes</u>	<u>FAC</u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>55</u>				
50% of total cover: <u>27.5</u>		20% of total cover: <u>11</u>		
Herb Stratum				Hydrophytic Vegetation Indicators: X Dominance Test is >50% X Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Calamagrostis canadensis</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Equisetum arvense</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Sanguisorba canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>	
4. <u>Carex bigelowii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
5. <u>Carex microchaeta</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
6. <u>Festuca altaica</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
7. <u>Rubus arcticus s.l.</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
8. <u>Angelica lucida</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
9. <u>Epilobium angustifolium</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
10. <u>Anemone richardsonii</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>93</u>				
50% of total cover: <u>46.5</u>		20% of total cover: <u>18.6</u>		
Plot size (radius, or length x width) <u>1/10 acre</u>		% Bare Ground <u> </u>		
% Cover of Wetland Bryophytes <u>0</u>		% Cover of Bryophytes <u>40</u>		
(Where applicable)				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-12									hor:Oe
12-16	10YR 3/2	100					No	Silt Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks: Few cobbles at 12".

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> X Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> X FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):				
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):				
Saturation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position: valley

Additional Reference Data: Overflow Vegetation

HDR2068_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Polemonium acutiflorum	1	No	FAC
Polygonum viviparum	1	No	FAC
Valeriana capitata	1	No	FAC
Pyrola asarifolia	1	No	FACU
Trientalis europaea	1	No	FACU
Lagotis glauca s.l.	1	No	NL

Additional Reference Data: Photos

HDR2068_18



Photo Name: Photo_180708131240



Photo Name: Photo_180708131215



Photo Name: Photo_180708131223



Photo Name: Photo_180708131151



Photo Name: Photo_180708130537



Photo Name: Photo_180708131231

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/8/2018
 Applicant/Owner: PLP Sampling Point: HDR2070_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Terrace
 Local Relief (concave, convex, none): Concave Slope(%): _____ HGM: Slope
 Subregion (LRR): X Lat: 59.886658 Long: -155.397354 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PEM1B

Vegetation Type: Bluejoint Tall Grass (BTG)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)
 Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ X _____ No _____
 Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No _____
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes <u>X</u>	No _____			

Remarks: BTG on slight terrace adjacent to stream. Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>1</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>1</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. _____	_____	_____	_____	Total % Cover of: _____ Multiply by: _____
2. _____	_____	_____	_____	OBL species <u>11</u> x1= <u>11</u>
3. _____	_____	_____	_____	FACW species <u>3</u> x2= <u>6</u>
4. _____	_____	_____	_____	FAC species <u>104</u> x3= <u>312</u>
5. _____	_____	_____	_____	FACU species <u>19</u> x4= <u>76</u>
6. _____	_____	_____	_____	UPL species _____ x5= _____
Total Cover: _____				Column Totals: <u>137</u> (A) <u>405</u> (B)
50% of total cover: <u>0</u>				Prevalence Index = B/A= <u>2.96</u>
20% of total cover: <u>0</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>95</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Chamaenerion angustifolium</u>	<u>8</u>	<u>No</u>	<u>FACU</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Comarum palustre</u>	<u>8</u>	<u>No</u>	<u>OBL</u>	Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Dryopteris expansa</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Anemone richardsonii</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
7. <u>Angelica lucida</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
8. <u>Spiraea stevenii</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
9. <u>Sanguisorba canadensis</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	
10. <u>Caltha palustris</u>	<u>2</u>	<u>No</u>	<u>OBL</u>	
Total Cover: <u>139</u>				
50% of total cover: <u>69.5</u>				
20% of total cover: <u>27.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes ³ _____				
(Where applicable)				

Remarks:

Spi ste added to herb stratum because shrub stratum has <5% cover.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-9									hor:Oe
9-16	10YR 3/2	100						Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type:			Yes	<input checked="" type="checkbox"/> X	No
Depth (inches):					
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> X Drainage Patterns (B10)	
<input checked="" type="checkbox"/> X High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> X Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input checked="" type="checkbox"/> X Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):		
Water Table Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	2.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	0.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Water flowing into pit from surface. Likely some episaturation. Hummocky with drainage between hummocks, likely from recent precip.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2070_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Rubus arcticus s.l.	1	No	FAC
Saxifraga sp.	1	No	N/A
Viola sp.	1	No	N/A
Rumex occidentalis	1	No	OBL

Additional Reference Data: Photos

HDR2070_18



Photo Name: Photo_180708142108



Photo Name: Photo_180708142115



Photo Name: Photo_180708135901



Photo Name: Photo_180708135910



Photo Name: Photo_180708135851



Photo Name: Photo_180708135856

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/8/2018
 Applicant/Owner: PLP Sampling Point: HDR2072_18
 Investigators: MNW AG Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): _____ HGM: N/A
 Subregion (LRR): X Lat: 59.885834 Long: -155.397049 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)
 Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>3</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>90</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	OBL species _____ x1= _____
3. <u>Spiraea beauverdiana</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	FACW species _____ x2= _____
4. <u>Betula nana</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FAC species <u>137</u> x3= <u>411</u>
5. <u>Ledum decumbens</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FACU species <u>11</u> x4= <u>44</u>
6. _____	_____	_____	_____	UPL species _____ x5= _____
Total Cover: <u>124</u>				Column Totals: <u>148</u> (A) <u>455</u> (B)
50% of total cover: <u>62</u>				Prevalence Index = B/A= <u>3.07</u>
20% of total cover: <u>24.8</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex microchaeta</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Cornus suecica</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Festuca altaica</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Dryopteris expansa</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Gentiana sp.</u>	<u>1</u>	<u>No</u>	<u>N/A</u>	
7. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology
8. _____	_____	_____	_____	must be present, unless disturbed or problematic.
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>25</u>				
50% of total cover: <u>12.5</u>				
20% of total cover: <u>5</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes _____ % Cover of Bryophytes _____				Yes <u>X</u> No _____
(Where applicable)				Present?

Remarks: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-5									hor:Oe
5-12	10YR 3/4	100					No	Sandy Loam	hor:B1
12-17	10YR 3/2	100					No	Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		
Type: _____		
Depth (inches): _____		
Field Drainage Class: SPD - Somewhat Poorly Drained	Hydric Soil Present?	Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Remarks: No indicators

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Saturation Present? Yes <input checked="" type="checkbox"/> X <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): 8.0	Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> X <input type="checkbox"/> No <input type="checkbox"/>
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Episaturation at 8", glistening at 10", but no water table.

Geomorphic Position:



Photo Name: Photo_180708145848



Photo Name: Photo_180708145648



Photo Name: Photo_180708145837



Photo Name: Photo_180708145827



Photo Name: Photo_180708145856



Photo Name: Photo_180708145631

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/8/2018
 Applicant/Owner: PLP Sampling Point: HDR2076_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Valleybottom
 Local Relief (concave, convex, none): Concave Slope(%): 6 HGM: Slope
 Subregion (LRR): X Lat: 59.886818 Long: -155.397018 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PEM1/SS1C

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>8</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>8</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix reticulata</u>	<u>45</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by: <u> </u>
2. <u>Salix pulchra</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>4</u> x1= <u>4</u>
3. <u>Empetrum nigrum</u>	<u>7</u>	<u>No</u>	<u>FAC</u>	FACW species <u>13</u> x2= <u>26</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>119</u> x3= <u>357</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>4</u> x4= <u>16</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u>3</u> x5= <u>15</u>
Total Cover: <u>67</u>				Column Totals: <u>143</u> (A) <u>418</u> (B)
50% of total cover: <u>33.5</u>				Prevalence Index = B/A= <u>2.92</u>
20% of total cover: <u>13.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>7</u>	<u>Yes</u>	<u>FACW</u>	Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Rubus arcticus s.l.</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Petasites frigidus s.l.</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>	
7. <u>Anemone richardsonii</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Micranthes hieraciifolia</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Anemone narcissiflora</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
10. <u>Artemisia arctica</u>	<u>3</u>	<u>No</u>	<u>NL</u>	
Total Cover: <u>76</u>				
50% of total cover: <u>38</u>				
20% of total cover: <u>15.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u>10</u> % Cover of Bryophytes <u>20</u>				
(Where applicable)				
Remarks: <u>Sphagnum in lows between hummocks.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-8									hor:Oe
8-14	10YR 5/3	100						Loamy Very Fine	hor:B1
14-18	10YR 5/3	90	7,5YR 4/4	10	C	M		Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:

☐ Histosol or Histel (A1)

☒ Histic Epipedon (A2)

☐ Hydrogen Sulfide (A4)

☐ Thick Dark Surface (A12)

☐ Alaska Gleyed (A13)

☐ Alaska Redox (A14)

☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:

☐ Alaska Color Change (TA4)⁴

☐ Alaska Alpine Swales (TA5)

☐ Alaska Redox With 2.5Y Hue

☐ Alaska Gleyed Without Hue 5Y or Redder

☐ Underlying Layer

☐ Other (Explain in Remarks)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

Restrictive Layer (if present):
Type:
Depth (inches):
Field Drainage Class: PD - Poorly Drained

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)

☐ Surface Water (A1)

☒ High Water Table (A2)

☒ Saturation (A3)

☐ Water Marks (B1)

☐ Sediment Deposits (B2)

☐ Drift Deposits (B3)

☐ Algal Mat or Crust (B4)

☐ Iron Deposits (B5)

☐ Surface Soil Cracks (B6)

☐ Inundation Visible on Aerial Imagery (B7)

☐ Sparsely Vegetated Concave Surface (B8)

☐ Marl Deposits (B15)

☐ Hydrogen Sulfide Odor (C1)

☐ Dry Season Water Table (C2)

☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

☐ Water-stained Leaves (B9)

☒ Drainage Patterns (B10)

☐ Oxidized Rhizospheres along Living Roots (C3)

☐ Presence of Reduced Iron (C4)

☐ Salt Deposits (C5)

☐ Stunted or Stressed Plants (D1)

☐ Geomorphic Position (D2)

☐ Shallow Aquitard (D3)

☒ Microtopographic Relief (D4)

☒ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ☐ No ☒ Depth (inches):
Water Table Present? Yes ☒ No ☐ Depth (inches):

0.0

Saturation Present? Yes ☒ No ☐ Depth (inches):

0.0

(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hummocks oriented linearly down slope. Very saturated in troughs between hummocks.

Geomorphic Position: Valley

Additional Reference Data: Overflow Vegetation

HDR2076_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Comarum palustre	3	No	OBL
Luzula parviflora	1	No	FAC
Pedicularis verticillata	1	No	FAC
Polemonium acutiflorum	1	No	FAC
Polygonum viviparum	1	No	FAC
Sedum rosea ssp. integrifolium	1	No	FAC
Valeriana capitata	1	No	FAC
Trientalis europaea	1	No	FACU
Rubus chamaemorus	1	No	FACW
Cardamine pratensis	1	No	OBL

Additional Reference Data: Photos

HDR2076_18



Photo Name: Photo_180708155658



Photo Name: Photo_180708155633



Photo Name: Photo_180708155651



Photo Name: Photo_180708155624



Photo Name: Photo_180708155710



Photo Name: Photo_180708155644

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	7/9/2018
Applicant/Owner:	PLP			Sampling Point:	HDR2077_18
Investigators:	MNW AG	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	Concave	Slope(%):		HGM:	N/A
Subregion (LRR):	X	Lat:	59.914398	Long:	-155.373642
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	U		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-7									hor:Oe
7-12	10YR 3/2	100					No	Silt Loam	hor:B1 Cobbles start at 7"
12-16	10YR 4/4	100					No	Sandy Loam	hor:B2
16-18	10YR 4/6	100					No	Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: _____					
Depth (inches): _____					
Field Drainage Class: SPD - Somewhat Poorly Drained					

Remarks: Cobbles starting at 7"

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	X	No
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches): _____				
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): 12.0				
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): 0.0				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2077_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Pyrola rotundifolia	1	No	FACU
Trientalis europaea	1	No	FACU
Laqotis glauca s.l.	1	No	NL

Additional Reference Data: Photos

HDR2077_18



Photo Name: Photo_180709083906



Photo Name: Photo_180709083901

Additional Reference Data: Photos

HDR2077_18



Photo Name: Photo_180709083855



Photo Name: Photo_180709081653



Photo Name: Photo_180709083849

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/9/2018</u>
Applicant/Owner: <u>PLP</u>		Sampling Point: <u>HDR2081_18</u>
Investigators: <u>MNW AG</u>	Landform (hillslope, terrace, etc.): <u>Valleybottom</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>1</u>	HGM: <u>Depressional</u>
Subregion (LRR): <u>X</u> Lat: <u>59.917664</u>	Long: <u>-155.367279</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Closed Willow Low Shrub (CWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If No, explain in Remarks)

Are Vegetation: ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation: ☐ Soil ☒ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks: Wetter than normal antecedent precipitation.		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>3</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. Salix pulchra	95	Yes	FAC	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u>
2. Vaccinium uliginosum	12	No	FAC	OBL species <u> </u> x1= <u> </u>
3. Spiraea beauverdiana	5	No	FACU	FACW species <u>25</u> x2= <u>50</u>
4. _____	_____	_____	_____	FAC species <u>141</u> x3= <u>423</u>
5. _____	_____	_____	_____	FACU species <u>9</u> x4= <u>36</u>
6. _____	_____	_____	_____	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>112</u>				Column Totals: <u>175</u> (A) <u>509</u> (B)
50% of total cover: <u>56</u>				<u>Prevalence Index = B/A=</u> <u>2.91</u>
20% of total cover: <u>22.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. Sanguisorba canadensis	25	Yes	FACW	<input checked="" type="checkbox"/> Dominance Test is >50%
2. Calamagrostis canadensis	15	Yes	FAC	<input checked="" type="checkbox"/> Prevalence Index is ≤3.0
3. Anemone richardsonii	5	No	FAC	<u> </u> Morphological Adaptations ¹ (Provide
4. Rubus arcticus s.l.	5	No	FAC	<u> </u> data in Remarks or on a separate sheet)
5. Viola epipsila	5	No	FAC	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. Equisetum arvense	2	No	FAC	
7. Pyrola rotundifolia	2	No	FACU	¹ Indicators of hydric soil and wetland hydrology
8. Carex sp.	2	No	N/A	must be present, unless disturbed or problematic.
9. Aconitum delphinifolium	1	No	FAC	
10. Valeriana capitata	1	No	FAC	
Total Cover: <u>65</u>				
50% of total cover: <u>32.5</u>				
20% of total cover: <u>13</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>5</u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u>25</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-4									hor:Oe
4-5	10YR 4/3	100					No	Silt Loam	hor:B1
5-16	2.5Y 4/2	60	7.5YR 4/6	20	C		No	Silt Loam	hor:B2 *4
5-16	2.5Y 4/3	20					No	Silt Loam	hor:B2 *5

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:
☐ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:
☐ Alaska Color Change (TA4)⁴
☐ Alaska Alpine Swales (TA5)
☒ Alaska Redox With 2.5Y Hue

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

☐ Alaska Gleyed Without Hue 5Y or Redder
☐ Underlying Layer
☐ Other (Explain in Remarks)

Restrictive Layer (if present):
Type: _____
Depth (inches): _____
Field Drainage Class: SPD - Somewhat Poorly Drained

Hydric Soil Present? Yes ☒ No ☐

Remarks: Very large cobble at 6". *4: Silt loam with pockets of sand and fine gravels. Redox is in 2.5Y 4/3 color as concentrations in pore linings in gravelly areas. *5: Silt loam with pockets of sand and fine gravels. Redox is in 2.5Y 4/3 color as concentrations in pore linings in gravelly areas.

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)
☐ Surface Water (A1)
☒ High Water Table (A2)
☒ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Marl Deposits (B15)
☐ Hydrogen Sulfide Odor (C1)
☐ Dry Season Water Table (C2)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)
☐ Water-stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☒ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ Microtopographic Relief (D4)
☒ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ☐ No ☒ Depth (inches): _____
Water Table Present? Yes ☒ No ☐ Depth (inches): 7.0
Saturation Present? Yes ☒ No ☐ Depth (inches): 2.0
(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Small pockets of standing water in plot

Geomorphic Position: Valley

Additional Reference Data: Overflow Vegetation

HDR2081_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Epilobium angustifolium	1	No	FACU
Trientalis europaea	1	No	FACU

Additional Reference Data: Photos

HDR2081_18



Photo Name: Photo_180709101231



Photo Name: Photo_180709101310

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/10/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2083_18</u>	
Investigators: <u>MW AG</u>	Landform (hillslope, terrace, etc.): <u>Valleybottom</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): _____	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.917839</u>	Long: <u>-155.367905</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Open Willow Low Shrub (OWLS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)

Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>		
Wetland Hydrology Present? Yes <u>X</u> No _____		
Remarks: Plot in transitional area. Wetter than normal antecedent precipitation.		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>5</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Vaccinium uliginosum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= _____
3. <u>Betula nana</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>8</u> x2= <u>16</u>
4. <u>Salix pulchra</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	FAC species <u>177</u> x3= <u>531</u>
5. <u>Rhododendron tomentosum</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	FACU species <u>10</u> x4= <u>40</u>
6. <u>Spiraea beauverdiana</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	UPL species <u> </u> x5= _____
Total Cover: <u>146</u>				Column Totals: <u>195</u> (A) <u>587</u> (B)
50% of total cover: <u>73</u>				Prevalence Index = B/A= <u>3.01</u>
20% of total cover: <u>29.2</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Carex bigelowii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Rubus chamaemorus</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
5. <u>Poa arctica</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sanguisorba canadensis</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	
7. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>49</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
50% of total cover: <u>24.5</u>				
20% of total cover: <u>9.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground _____				
% Cover of Wetland Bryophytes <u>0</u> (Where applicable)		% Cover of Bryophytes <u>20</u>		
Remarks: Trace: Gal bor, Val cap, Cha ang.				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-4	2.5Y2.5/2							Sandy Loam	hor:A
4-12	2.5Y3/2							Sandy Loam	hor:B1
12-16	2.5Y4/3	98	10YR4/4	2	C	PL		Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:
☐ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:
☐ Alaska Color Change (TA4)⁴
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox With 2.5Y Hue

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

☐ Alaska Gleyed Without Hue 5Y or Redder
☐ Underlying Layer
☐ Other (Explain in Remarks)

Restrictive Layer (if present):
Type: _____
Depth (inches): _____
Field Drainage Class: SPD - Somewhat Poorly Drained

Hydric Soil Present? Yes No ☒

Remarks: Cobbles at 4 inches.

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)
☐ Surface Water (A1)
☒ High Water Table (A2)
☒ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Marl Deposits (B15)
☐ Hydrogen Sulfide Odor (C1)
☐ Dry Season Water Table (C2)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)
☐ Water-stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ Microtopographic Relief (D4)
☒ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes No ☒ Depth (inches): _____
Water Table Present? Yes ☒ No _____ Depth (inches): 12.0
Saturation Present? Yes ☒ No _____ Depth (inches): 10.0
(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2083_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Salix rotundifolia	3	No	FAC
Vaccinium vitis-idaea	3	No	FAC

Additional Reference Data: Photos

HDR2083_18



Photo Name: Photo_180709111626



Photo Name: Photo_180709111620

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/9/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2085_18</u>	
Investigators: <u>MNW AG</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>6</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.916893</u>	Long: <u>-155.371780</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Closed Willow Tall Shrub (CWTS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>5</u> (B)
4. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>60</u> (A/B)
Total Cover: _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>15</u> x1= _____ FACW species <u>133</u> x2= <u>30</u> FAC species <u>54</u> x3= <u>399</u> FACU species _____ x4= <u>216</u> UPL species _____ x5= _____ Column Totals: <u>202</u> (A) <u>645</u> (B)
50% of total cover: <u>0</u>				
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Hydrophytic Vegetation Indicators: X Dominance Test is >50% Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Salix pulchra</u>	<u>85</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Spiraea beauverdiana</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
3. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Total Cover: <u>90</u>				
50% of total cover: <u>45</u> 20% of total cover: <u>18</u>				
Herb Stratum				
1. <u>Calamagrostis canadensis</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Sanguisorba canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>	
3. <u>Cornus canadensis</u>	<u>12</u>	<u>Yes</u>	<u>FACU</u>	
4. <u>Epilobium angustifolium</u>	<u>12</u>	<u>Yes</u>	<u>FACU</u>	
5. <u>Geranium erianthum</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	
6. <u>Aconitum delphinifolium</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
7. <u>Rubus arcticus s.l.</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
8. <u>Lycopodium annotinum s.l.</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
9. <u>Pyrola asarifolia</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
10. <u>Streptopus amplexifolius</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>112</u>				
50% of total cover: <u>56</u> 20% of total cover: <u>22.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u>25</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-4									hor:Oe
4-14	10YR 4/4	100					No	Sandy Loam	hor:B1
14-16	10YR 3/3	100					No	Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	
Type: _____		Yes	No
Depth (inches): _____			X
Field Drainage Class: MWD - Moderately Well Drained			

Remarks: No redox , cobbles at 4"

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Yes	No
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X		X
Saturation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X		
(includes capillary fringe)	Depth (inches): _____		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No water or saturation

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2085_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Equisetum sylvaticum	2	No	FAC
Valeriana capitata	1	No	FAC

Additional Reference Data: Photos

HDR2085_18



Photo Name: Photo_180709130242



Photo Name: Photo_180709130253



Photo Name: Photo_180709130247



Photo Name: Photo_180709124948



Photo Name: Photo_180709130230

Photo Name: Photo_180709124955



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/9/2018
 Applicant/Owner: PLP Sampling Point: HDR2087_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Floodplain
 Local Relief (concave, convex, none): Concave Slope(%): _____ HGM: N/A
 Subregion (LRR): X Lat: 59.916805 Long: -155.376373 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Willow Tall Shrub (OWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)
 Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ X _____ No _____
 Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>		
Wetland Hydrology Present?	Yes _____	No <u>X</u>		

Remarks: Adjacent to stream. Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>4</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Salix alaxensis</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species _____ x1= _____
3. <u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	FACW species <u>27</u> x2= <u>54</u>
4. <u>Viburnum edule</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	FAC species <u>84</u> x3= <u>252</u>
5. _____	_____	_____	_____	FACU species <u>33</u> x4= <u>132</u>
6. _____	_____	_____	_____	UPL species _____ x5= _____
Total Cover: <u>67</u>				Column Totals: <u>144</u> (A) <u>438</u> (B)
50% of total cover: <u>33.5</u>				Prevalence Index = B/A= <u>3.04</u>
20% of total cover: <u>13.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Sanguisorba canadensis</u>	<u>25</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Chamaenerion angustifolium</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Dryopteris expansa</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Anemone richardsonii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Geranium erianthum</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
7. <u>Sedum rosea ssp. integrifolium</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Viola epipsila</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Epilobium leptocarpum</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
10. <u>Trientalis europaea</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>77</u>				
50% of total cover: <u>38.5</u>				
20% of total cover: <u>15.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes _____ % Cover of Bryophytes _____				
(Where applicable)				

Remarks: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-6									hor:Oe
6-10	10YR3/2	100					No	Silt Loam	hor:A
10-16	10YR 4/2	95	7.5YR4/6	5	C	PL	No	Fine Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: WD - Well Drained	Hydric Soil Present? Yes _____ No _____ X _____
---	--

Remarks: Cobbles at 6"

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No _____ X _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ X _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ X _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____ X _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary indicators

Geomorphic Position:

Additional Reference Data: Photos

HDR2087_18



Photo Name: Photo_180709140024



Photo Name: Photo_180709135943



Photo Name: Photo_180709135913

Additional Reference Data: Photos

HDR2087_18



Photo Name: Photo_180709140000



Photo Name: Photo_180709140019



Photo Name: Photo_180709135955

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/9/2018
 Applicant/Owner: PLP Sampling Point: HDR2088_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Floodplain
 Local Relief (concave, convex, none): Concave Slope(%): _____ HGM: Riverine
 Subregion (LRR): X Lat: 59.916286 Long: -155.376083 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PEM1B

Vegetation Type: Subarctic Sedge – Moss Wet Meadow (SSMWM)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)
 Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ X _____ No _____
 Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____		
Wetland Hydrology Present?	Yes <u>X</u>	No _____		

Remarks: Small SSMWM in clearing from in willow dominated floodplain. Stream flows to west of clearing. Small diversion stream also flowing to east of clearing and rejoins main channel. Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>4</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> _____ <u>Multiply by:</u> _____
1. <u>Salix pulchra</u>	<u>8</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>65</u> x1= <u>65</u>
2. _____	_____	_____	_____	FACW species _____ x2= _____
3. _____	_____	_____	_____	FAC species <u>11</u> x3= <u>33</u>
4. _____	_____	_____	_____	FACU species _____ x4= _____
5. _____	_____	_____	_____	UPL species _____ x5= _____
6. _____	_____	_____	_____	Column Totals: <u>76</u> (A) <u>98</u> (B)
Total Cover: <u>8</u>				<u>Prevalence Index = B/A =</u> <u>1.29</u>
50% of total cover: <u>4</u>				
20% of total cover: <u>1.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex pluriflora</u>	<u>25</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Dominance Test is >50%
2. <u>Comarum palustre</u>	<u>25</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Eriophorum angustifolium</u>	<u>15</u>	<u>Yes</u>	<u>OBL</u>	Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. _____	_____	_____	_____	Problematic Hydrophytic Vegetation ¹ (Explain)
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>68</u>				
50% of total cover: <u>34</u>				
20% of total cover: <u>13.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>30</u>				Yes <u>X</u> No _____
% Cover of Bryophytes <u>30</u>				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-20									hor:Oi

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type:			Yes	<input checked="" type="checkbox"/> X	No
Depth (inches):					
Field Drainage Class:					

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> X Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> X FAC-Neutral Test (D5)	

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):		
Water Table Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	20.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	0.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position: floodplain

Additional Reference Data: Photos

HDR2088_18



Photo Name: Photo_180709144320



Photo Name: Photo_180709144305



Photo Name: Photo_180709143734

Additional Reference Data: Photos

HDR2088_18



Photo Name: Photo_180709144254



Photo Name: Photo_180709143721



Photo Name: Photo_180709144312

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/9/2018
 Applicant/Owner: PLP Sampling Point: HDR2091_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 12 HGM: N/A
 Subregion (LRR): X Lat: 59.917126 Long: -155.377518 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Alder Tall Shrub (OATS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>67</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Alnus sinuata</u>	60	Yes	FAC	OBL species <u> </u> x1= <u> </u>
2. <u>Spiraea beauverdiana</u>	3	No	FACU	FACW species <u>8</u> x2= <u>16</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>138</u> x3= <u>414</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>51</u> x4= <u>204</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>197</u> (A) <u>634</u> (B)
Total Cover: <u>63</u>				<u>Prevalence Index = B/A=</u> <u>3.22</u>
50% of total cover: <u>31.5</u>				
20% of total cover: <u>12.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	70	Yes	FAC	<u>X</u> Dominance Test is >50%
2. <u>Dryopteris expansa</u>	40	Yes	FACU	Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	8	No	FACW	Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	5	No	FAC	data in Remarks or on a separate sheet)
5. <u>Chamaenerion angustifolium</u>	5	No	FACU	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Athyrium americanum</u>	3	No	FAC	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Trientalis europaea</u>	3	No	FACU	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>134</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>67</u>				
20% of total cover: <u>26.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>5</u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes ⁵ <u> </u>				
(Where applicable)				
Remarks: <u>Trace: Rib gla, Str amp, Ang luc.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-3									hor:Oe
3-6	10YR3/2	100						Sandy Loam	hor:A
6-18	10YR3/4	95						Sandy Loam	hor:B *4

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: _____					
Depth (inches): _____					
Field Drainage Class: SPD - Somewhat Poorly Drained					

Remarks: No indicators *4: Inclusion of SiL at 13-14" on one side of pit. 5% of total layer. Matrix 2.5Y 6/2 w 5% redox conc in sandy incl. 7.5YR 4/6

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	No	X
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches): _____				
Water Table Present? Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches): 16.0				
Saturation Present? Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches): 13.0				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary indicators. Adjacent to stream.

Geomorphic Position: gully

Additional Reference Data: Photos

HDR2091_18



Photo Name: Photo_180709152941



Photo Name: Photo_180709152111



Photo Name: Photo_180709152118

Additional Reference Data: Photos

HDR2091_18



Photo Name: Photo_180709152918



Photo Name: Photo_180709153001



Photo Name: Photo_180709153011

Additional Reference Data: Photos

HDR2091_18



Photo Name: Photo_180709152929



Photo Name: Photo_180709152906

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/10/2018
 Applicant/Owner: PLP Sampling Point: HDR2092_18
 Investigators: MNW AG Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 3 HGM: Slope
 Subregion (LRR): X Lat: 59.911835 Long: -155.361328 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PEM1/SS1B

Vegetation Type: Subarctic Sedge – Moss Wet Meadow (SSMWM)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>45</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u>69</u> <u>Multiply by:</u>
2. <u>Ledum decumbens</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	OBL species <u>69</u> x1= <u>69</u>
3. <u>Betula nana</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
4. <u>Vaccinium uliginosum</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FAC species <u>62</u> x3= <u>186</u>
5. <u>Vaccinium oxycoccos</u>	<u>1</u>	<u>No</u>	<u>OBL</u>	FACU species <u> </u> x4= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>53</u>				Column Totals: <u>131</u> (A) <u>255</u> (B)
50% of total cover: <u>26.5</u>				<u>Prevalence Index = B/A=</u> <u>1.95</u>
20% of total cover: <u>10.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex pluriflora</u>	<u>35</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Dominance Test is >50%
2. <u>Comarum palustre</u>	<u>30</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Carex podocarpa</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Eriophorum angustifolium</u>	<u>3</u>	<u>No</u>	<u>OBL</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>78</u>				
50% of total cover: <u>39</u>				
20% of total cover: <u>15.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>90</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>90</u>				Present?
(Where applicable)				
Remarks: <u>Sal pul is less than 6 inches tall at site.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-16									hor:Oi

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: VPD - Very Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 6.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Photo Name: Photo_180710084247



Photo Name: Photo_180710084143



Photo Name: Photo_180710084219



Additional Reference Data: Photos

HDR2092_18



Photo Name: Photo_180710084118



Photo Name: Photo_180710084240



Photo Name: Photo_180710084230

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/10/2018
 Applicant/Owner: PLP Sampling Point: HDR2093_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 4 HGM: Slope
 Subregion (LRR): X Lat: 59.912136 Long: -155.362030 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PEM1/SS1C

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u>75</u> <u>Multiply by:</u>
2. <u>Betula nana</u>	<u>13</u>	<u>No</u>	<u>FAC</u>	OBL species <u>75</u> x1= <u>75</u>
3. <u>Vaccinium uliginosum</u>	<u>12</u>	<u>No</u>	<u>FAC</u>	FACW species <u>9</u> x2= <u>18</u>
4. <u>Empetrum nigrum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>115</u> x3= <u>345</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u> </u> x4= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>70</u>				Column Totals: <u>199</u> (A) <u>438</u> (B)
50% of total cover: <u>35</u>				<u>Prevalence Index = B/A=</u> <u>2.20</u>
20% of total cover: <u>14</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex pluriflora</u>	<u>40</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Dominance Test is >50%
2. <u>Comarum palustre</u>	<u>35</u>	<u>Yes</u>	<u>OBL</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Eriophorum russeolum s.l.</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Petasites frigidus s.l.</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	
7. <u>Rumex arcticus</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>129</u>				
50% of total cover: <u>64.5</u>				
20% of total cover: <u>25.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>60</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>80</u>				Present?
(Where applicable)				
Remarks: <u>Trace Epilobium sp.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-8									hor:Oi
8-20	10Y 2.5/1	100					Yes	Sandy Clay Loam	Strong a-a rxn

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input checked="" type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: _____		
Depth (inches): _____		
Field Drainage Class: VPD - Very Poorly Drained		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input checked="" type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): 2.0	
Water Table Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): 3.0	
Saturation Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): 0.0	
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Seeps in willows upslope. Standing water, stream to E

Geomorphic Position: Terrace on hillslope

Additional Reference Data: Photos

HDR2093_18



Photo Name: Photo_180710090944



Photo Name: Photo_180710090938



Photo Name: Photo_180710090949

Additional Reference Data: Photos

HDR2093_18



Photo Name: Photo_180710090930



Photo Name: Photo_180710090901



Photo Name: Photo_180710090851

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/10/2018
 Applicant/Owner: PLP Sampling Point: HDR2095_18
 Investigators: MNW AG Landform (hillslope, terrace, etc.): Terrace
 Local Relief (concave, convex, none): Concave Slope(%): 4 HGM: Slope
 Subregion (LRR): X Lat: 59.912437 Long: -155.362381 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/EM1B

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Vaccinium uliginosum</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by: <u> </u>
2. <u>Betula nana</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Empetrum nigrum</u>	<u>25</u>	<u>No</u>	<u>FAC</u>	FACW species <u>2</u> x2= <u>4</u>
4. <u>Salix pulchra</u>	<u>25</u>	<u>No</u>	<u>FAC</u>	FAC species <u>195</u> x3= <u>585</u>
5. <u>Ledum decumbens</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACU species <u> </u> x4= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>160</u>				Column Totals: <u>197</u> (A) <u>589</u> (B)
50% of total cover: <u>80</u>				Prevalence Index = B/A= <u>2.99</u>
20% of total cover: <u>32</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex podocarpa</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Carex bigelowii</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Luzula parviflora</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Petasites frigidus s.l.</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Rubus chamaemorus</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>37</u>				
50% of total cover: <u>18.5</u>				
20% of total cover: <u>7.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u> </u>				
% Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-8									hor:Oe
8-16	2.5Y 5/2	80	10YR 5/6	20	C	PL	No	Sandy Clay Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: _____		
Depth (inches): _____		
Field Drainage Class: VPD - Very Poorly Drained		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 4.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position: terrace on hillslope

Additional Reference Data: Photos

HDR2095_18



Photo Name: Photo_180710094018



Photo Name: Photo_180710094028



Photo Name: Photo_180710094045



Photo Name: Photo_180710094037



Photo Name: Photo_180710094008



Photo Name: Photo_180710094056

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/10/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2097_18</u>	
Investigators: <u>MW AG</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>Convex</u>	Slope(%): _____	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.911594</u>	Long: <u>-155.361145</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Bluejoint Tall Grass (BTG)</u>		NWI Classification: <u>PEM1B</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)

Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation: _____ Soil X or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____		
Wetland Hydrology Present? Yes <u>X</u> No _____		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>4</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> _____ <u>Multiply by:</u> _____
2. <u>Vaccinium uliginosum</u>	<u>3</u>	<u>Yes</u>	<u>FAC</u>	OBL species _____ x1= _____
3. <u>Empetrum nigrum</u>	<u>2</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>5</u> x2= <u>10</u>
4. _____	_____	_____	_____	FAC species <u>116</u> x3= <u>348</u>
5. _____	_____	_____	_____	FACU species <u>7</u> x4= <u>28</u>
6. _____	_____	_____	_____	UPL species _____ x5= _____
Total Cover: <u>10</u>				Column Totals: <u>128</u> (A) <u>386</u> (B)
50% of total cover: <u>5</u>				<u>Prevalence Index = B/A=</u> <u>3.02</u>
20% of total cover: <u>2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>100</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Petasites frigidus s.l.</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Polemonium acutiflorum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Chamaenerion angustifolium</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Poa alpigena</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
7. <u>Trientalis europaea</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>118</u>				
50% of total cover: <u>59</u>				
20% of total cover: <u>23.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes _____				Yes <u>X</u> No _____
(Where applicable)				Present?

Remarks:
Trace: Aco del, Ang luc, Rub cha.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-6	2.5Y4/3	85	7.5YR4/6	15	C	PL RC	No	Sandy Clay Loam	hor:B1
6-8	7.5YR4/6	100					No	Sandy Clay Loam	hor:B2
8-20	10YR3/2	100					No	Sandy Clay Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input checked="" type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks: Sandy clay loam slows water

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> X Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> X Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):				
Water Table Present?	Yes <input checked="" type="checkbox"/> X No <input type="checkbox"/> Depth (inches):				
Saturation Present?	Yes <input checked="" type="checkbox"/> X No <input type="checkbox"/> Depth (inches):				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position: Slight terrace on hill slope below wetlands fed by seeps

Additional Reference Data: Photos

HDR2097_18



Photo Name: Photo_180710103016



Photo Name: Photo_180710102953



Photo Name: Photo_180710103025

Additional Reference Data: Photos

HDR2097_18



Photo Name: Photo_180710102936



Photo Name: Photo_180710103032



Photo Name: Photo_180710103008

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/10/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2098_18</u>	
Investigators: <u>MNW AG</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>6</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.912094</u>	Long: <u>-155.361115</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra (DEST)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Vaccinium uliginosum</u>	<u>65</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u>2</u> <u>Multiply by:</u>
2. <u>Salix reticulata</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>2</u> x1= <u>2</u>
3. <u>Empetrum nigrum</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	FACW species <u>2</u> x2= <u>4</u>
4. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>171</u> x3= <u>513</u>
5. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u> </u> x4= <u> </u>
6. <u>Ledum decumbens</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	UPL species <u>1</u> x5= <u>5</u>
Total Cover: <u>137</u>				Column Totals: <u>176</u> (A) <u>524</u> (B)
50% of total cover: <u>68.5</u>				<u>Prevalence Index = B/A=</u> <u>2.98</u>
20% of total cover: <u>27.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>12</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Rubus chamaemorus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Carex aquatilis</u>	<u>2</u>	<u>No</u>	<u>OBL</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Luzula parviflora</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sedum rosea ssp. integrifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
7. <u>Hierochloe alpina</u>	<u>1</u>	<u>No</u>	<u>NL</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>39</u>				
50% of total cover: <u>19.5</u>				
20% of total cover: <u>7.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>10</u>				
% Cover of Bryophytes <u>75</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-0									hor:Oe
0-5									hor:Oi
5-7	10YR 3/3	100					No	Silt Loam	hor:B
7-12								Silt Loam	hor:B2 *4

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
Type: _____		
Depth (inches): _____		
Field Drainage Class: MWD - Moderately Well Drained		

Remarks: No indicators. Slope area with higher soil chroma and a high percentage of gravel. Water observed was expected to flow through the site at a rapid pace and not persist to influence soil. *4: Layer is >90% cobbles with no soil development.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes <input type="checkbox"/> X <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input type="checkbox"/> X <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 12.0		
Saturation Present? Yes <input type="checkbox"/> X <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 4.0		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:



Photo Name: Photo_180710111556



Photo Name: Photo_180710111525



Photo Name: Photo_180710111544

Additional Reference Data: Photos

HDR2098_18



Photo Name: Photo_180710111604



Photo Name: Photo_180710111549



Photo Name: Photo_180710111537

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/10/2018</u>
Applicant/Owner: <u>PLP</u>		Sampling Point: <u>HDR2100_18</u>
Investigators: <u>MNW AG</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>8</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.912483</u>	Long: <u>-155.358994</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PEM1B</u>	Datum: <u>WGS84</u>

Vegetation Type: Bluejoint Tall Grass (BTG)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u>1</u> <u>Multiply by:</u>
2. <u>Salix reticulata</u>	<u>3</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>1</u> x1= <u>1</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>8</u> x2= <u>16</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>120</u> x3= <u>360</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>6</u> x4= <u>24</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>13</u>				Column Totals: <u>135</u> (A) <u>401</u> (B)
50% of total cover: <u>6.5</u>				<u>Prevalence Index = B/A=</u> <u>2.97</u>
20% of total cover: <u>2.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>95</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Festuca altaica</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Angelica lucida</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Epilobium angustifolium</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
7. <u>Petasites frigidus s.l.</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Aconitum delphiniiifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Carex podocarpa</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u>Claytonia sarmentosa</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>122</u>				
50% of total cover: <u>61</u>				
20% of total cover: <u>24.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes <u>10</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-4	10YR 4/2	40	7.5YR 4/6	60	C	PL RC	Yes	Silt Loam	hor:B
4-8									hor:Oe Buried organic horizon
8-12	5Y 4/1	75	7.5YR 4/6	25	C		Yes	Silt Loam	hor:B1
12-14	2.5Y 5/1	100					Yes	Silt Loam	hor:B2
14-18	2.5Y 5/4	100					Yes	Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:

<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input checked="" type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: SPD - Somewhat Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-stained Leaves (B9)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Microtopographic Relief (D4)
	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 12.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 2.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Water seeping in at 4".

Geomorphic Position: toeslope

Additional Reference Data: Overflow Vegetation

HDR2100_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Luzula parviflora	1	No	FAC
Polemonium acutiflorum	1	No	FAC
Rubus arcticus s.l.	1	No	FAC
Sedum rosea ssp. integrifolium	1	No	FAC
Valeriana capitata	1	No	FAC
Galium boreale	1	No	FACU
Solidago multiradiata	1	No	FACU
Pedicularis lanqsdorfii	1	No	FACW
Carex utriculata	1	No	OBL

Additional Reference Data: Photos

HDR2100_18



Photo Name: Photo_180710125213



Photo Name: Photo_180710125236



Photo Name: Photo_180710125228



Photo Name: Photo_180710125147



Photo Name: Photo_180710125025



Photo Name: Photo_180710125205

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/10/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2103_18</u>	
Investigators: <u>MW AG</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>8</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.911888</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Closed Willow Low Shrub (CWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u>10</u> <u>Multiply by:</u> <u>10</u>
2. <u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	OBL species <u>10</u> x1= <u>10</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>15</u> x2= <u>30</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>119</u> x3= <u>357</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>18</u> x4= <u>72</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>80</u>				Column Totals: <u>162</u> (A) <u>469</u> (B)
50% of total cover: <u>40</u>				<u>Prevalence Index = B/A=</u> <u>2.90</u>
20% of total cover: <u>16</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>18</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>17</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Chamaenerion angustifolium</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Carex utriculata</u>	<u>5</u>	<u>No</u>	<u>OBL</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Comarum palustre</u>	<u>5</u>	<u>No</u>	<u>OBL</u>	
7. <u>Anemone richardsonii</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Rubus arcticus s.l.</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Viola epipsila</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
10. <u>Pyrola asarifolia</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>82</u>				
50% of total cover: <u>41</u>				
20% of total cover: <u>16.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>15</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>40</u>				Present?
(Where applicable)				

Remarks:

Trace: Tri eur, Aco del, Val cap, Sed ros.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-15									hor:Oe
15-20	10YR4/2	95	7.5YR4/6	5	C		No	Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydic Soil Indicators:			Indicators for Problematic Hydic Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydic Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:									
Surface Water Present?	Yes		No	X	Depth (inches):				
Water Table Present?	Yes	X	No		Depth (inches):	15.0			
Saturation Present?	Yes	X	No		Depth (inches):	4.0			
(includes capillary fringe)									
					Wetland Hydrology Present?	Yes	X	No	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position: Toeslope

Additional Reference Data: Photos

HDR2103_18



Photo Name: Photo_180710142350



Photo Name: Photo_180710140412



Photo Name: Photo_180710142358

Additional Reference Data: Photos

HDR2103_18



Photo Name: Photo_180710142405



Photo Name: Photo_180710140420



Photo Name: Photo_180710142411

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/10/2018
 Applicant/Owner: PLP Sampling Point: HDR2104_18
 Investigators: MNW AG Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): None Slope(%): 9 HGM: N/A
 Subregion (LRR): X Lat: 59.911686 Long: -155.358994 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>90</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Vaccinium uliginosum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
4. <u>Salix reticulata</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FAC species <u>121</u> x3= <u>363</u>
5. <u>Spiraea stevenii</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	FACU species <u>4</u> x4= <u>16</u>
6. <u>Vaccinium vitis-idaea</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>110</u>				Column Totals: <u>125</u> (A) <u>379</u> (B)
50% of total cover: <u>55</u>				Prevalence Index = B/A= <u>3.03</u>
20% of total cover: <u>22</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	<u>7</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex podocarpa</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Angelica lucida</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Sedum rosea ssp. integrifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>15</u>				
50% of total cover: <u>7.5</u>				
20% of total cover: <u>3</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>7</u>				Present?
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oe
4-10	10YR 3/3	100					No	Sandy Loam	hor:B
10-14	2.5Y 5/3	100					No	Fine Sandy Loam	hor:B1 15% cobble
14-16	10YR 3/2	100					No	Fine Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	
Type: _____		Yes	No
Depth (inches): _____			X
Field Drainage Class: SPD - Somewhat Poorly Drained			

Remarks: No indicators

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Yes	No
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> X		
Saturation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> X		
(includes capillary fringe)			
Depth (inches): _____			
Depth (inches): 11.0			
Depth (inches): 5.0			

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position: toeslope

Additional Reference Data: Photos

HDR2104_18



Photo Name: Photo_180710143007



Photo Name: Photo_180710144122



Photo Name: Photo_180710144130

Additional Reference Data: Photos

HDR2104_18



Photo Name: Photo_180710143030



Photo Name: Photo_180710144139



Photo Name: Photo_180710144149

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/10/2018
 Applicant/Owner: PLP Sampling Point: HDR2106_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): Concave Slope(%): 3 HGM: N/A
 Subregion (LRR): X Lat: 59.911457 Long: -155.357361 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u> </u> X <u> </u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u> </u> X <u> </u>
Hydric Soil Present?	Yes <u> </u> No <u> </u> X <u> </u>			
Wetland Hydrology Present?	Yes <u> </u> No <u> </u> X <u> </u>			

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u> </u> 3 <u> </u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant Species Across All Strata: <u> </u> 3 <u> </u> (B)
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u> </u> 100 <u> </u> (A/B)
Total Cover: <u> </u>				Prevalence Index worksheet:
50% of total cover: <u> </u> 0 <u> </u>				
20% of total cover: <u> </u> 0 <u> </u>				
Sapling/Shrub Stratum				
1. <u>Empetrum nigrum</u>	80	Yes	FAC	Total % Cover of: <u> </u> Multiply by:
2. <u>Vaccinium uliginosum</u>	60	Yes	FAC	OBL species <u> </u> x1= <u> </u>
3. <u>Salix arctica</u>	8	No	FAC	FACW species <u> </u> 6 <u> </u> x2= <u> </u> 12 <u> </u>
4. <u>Betula nana</u>	7	No	FAC	FAC species <u> </u> 178 <u> </u> x3= <u> </u> 534 <u> </u>
5. <u>Vaccinium vitis-idaea</u>	5	No	FAC	FACU species <u> </u> 6 <u> </u> x4= <u> </u> 24 <u> </u>
6. <u>Spiraea beauverdana</u>	3	No	FACU	UPL species <u> </u> x5= <u> </u>
Total Cover: <u> </u> 163 <u> </u>				Column Totals: <u> </u> 190 <u> </u> (A) <u> </u> 570 <u> </u> (B)
50% of total cover: <u> </u> 81.5 <u> </u>				<u> </u> Prevalence Index = B/A= <u> </u> 3.00 <u> </u>
20% of total cover: <u> </u> 32.6 <u> </u>				
Herb Stratum				
1. <u>Carex bigelowii</u>	15	Yes	FAC	Hydrophytic Vegetation Indicators:
2. <u>Equisetum arvense</u>	3	No	FAC	
3. <u>Cornus canadensis</u>	3	No	FACU	X Dominance Test is >50%
4. <u>Rubus chamaemorus</u>	3	No	FACW	X Prevalence Index is ≤3.0
5. <u>Sanguisorba canadensis</u>	3	No	FACW	Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Problematic Hydrophytic Vegetation ¹ (Explain)
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u> 27 <u> </u>				Hydrophytic Vegetation Present? Yes <u> </u> X <u> </u> No <u> </u>
50% of total cover: <u> </u> 13.5 <u> </u>				
20% of total cover: <u> </u> 5.4 <u> </u>				
Plot size (radius, or length x width) <u> </u> 1/10 acre <u> </u> % Bare Ground <u> </u> 5 <u> </u>				
% Cover of Wetland Bryophytes <u> </u> 0 <u> </u> % Cover of Bryophytes <u> </u> 10 <u> </u>				
(Where applicable)				

Remarks:

Bare ground btwn some microlows. Trace: Bis plu, Tri eur, Cal can, Sed ros.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-6									hor:Oe
6-10	10YR3/2	100						Sandy Loam	hor:B1
10-17	2.5Y4/3	75	10YR4/4	25	C			Sandy Loam	hor:B2
17-20	2.5Y5/2	80	10YR4/4	20	C	PL RC		Sandy Clay Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present):	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Type: _____	
Depth (inches): _____	
Field Drainage Class: MWD - Moderately Well Drained	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 19.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 13.0		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No standing water btwn microlows

Geomorphic Position:

Additional Reference Data: Photos

HDR2106_18



Photo Name: Photo_180710152255



Photo Name: Photo_180710152306



Photo Name: Photo_180710152316

Additional Reference Data: Photos

HDR2106_18



Photo Name: Photo_180710152230



Photo Name: Photo_180710152323



Photo Name: Photo_180710152238

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/10/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2107_18</u>	
Investigators: <u>MNW AG</u>	Landform (hillslope, terrace, etc.): _____	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>0</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u> Lat: <u>59.911644</u>	Long: <u>-155.357498</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PEM1/SS1C</u>	

Vegetation Type: Subarctic Sedge – Moss Wet Meadow (SSMWM)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)

Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No _____
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes <u>X</u>	No _____			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>54</u> x1= <u>54</u> FACW species <u>35</u> x2= <u>70</u> FAC species <u>12</u> x3= <u>36</u> FACU species _____ x4= _____ UPL species _____ x5= _____ Column Totals: <u>101</u> (A) <u>160</u> (B) <i>Prevalence Index = B/A=</i> <u>1.58</u>
50% of total cover: <u>0</u>	_____	20% of total cover: <u>0</u>	_____	
Sapling/Shrub Stratum				
1. <u>Salix fuscescens</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Salix pulchra</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
Total Cover: <u>40</u>	_____	_____	_____	Hydrophytic Vegetation Indicators: <u>X</u> Dominance Test is >50% <u>X</u> Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
50% of total cover: <u>20</u>	_____	20% of total cover: <u>8</u>	_____	
Herb Stratum				
1. <u>Carex pluriflora</u>	<u>40</u>	<u>Yes</u>	<u>OBL</u>	
2. <u>Comarum palustre</u>	<u>7</u>	<u>No</u>	<u>OBL</u>	
3. <u>Eriophorum angustifolium</u>	<u>7</u>	<u>No</u>	<u>OBL</u>	
4. <u>Rubus chamaemorus</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
5. <u>Equisetum arvense</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>61</u>	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
50% of total cover: <u>30.5</u>	_____	20% of total cover: <u>12.2</u>	_____	
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>10</u>				
% Cover of Wetland Bryophytes <u>50</u>	_____	% Cover of Bryophytes <u>50</u>	_____	
(Where applicable)				
Remarks: <u>SSMWM</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-9									hor:Oi
9-17	2.5Y 4/2	100					Yes	Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present):

Type:

Depth (inches):

Field Drainage Class: PD - Poorly Drained

Hydric Soil Present? Yes ☒ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Secondary Indicators (2 or more required)

Primary Indicators (minimum of one required; check all that apply)

☒ Surface Water (A1)

☐ High Water Table (A2)

☒ Saturation (A3)

☐ Water Marks (B1)

☐ Sediment Deposits (B2)

☐ Drift Deposits (B3)

☐ Algal Mat or Crust (B4)

☐ Iron Deposits (B5)

☐ Surface Soil Cracks (B6)

☐ Inundation Visible on Aerial Imagery (B7)

☐ Sparsely Vegetated Concave Surface (B8)

☐ Marl Deposits (B15)

☐ Hydrogen Sulfide Odor (C1)

☐ Dry Season Water Table (C2)

☐ Other (Explain in Remarks)

☐ Water-stained Leaves (B9)

☐ Drainage Patterns (B10)

☐ Oxidized Rhizospheres along Living Roots (C3)

☐ Presence of Reduced Iron (C4)

☐ Salt Deposits (C5)

☐ Stunted or Stressed Plants (D1)

☐ Geomorphic Position (D2)

☐ Shallow Aquitard (D3)

☐ Microtopographic Relief (D4)

☒ FAC-Neutral Test (D5)

Field Observations:

Wetland Hydrology Present? Yes ☒ No

(includes capillary fringe)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks:

Surface water depth was not indicated on original field notes; assumed to be 1".

Geomorphic Position:

Additional Reference Data: Photos

HDR2107_18



Photo Name: Photo_180710155036



Photo Name: Photo_180710155015



Photo Name: Photo_180710155022



Photo Name: Photo_180710155008



Photo Name: Photo_180710154915



Photo Name: Photo_180710154925

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/11/2018
 Applicant/Owner: PLP Sampling Point: HDR2110_18
 Investigators: MNW AG Landform (hillslope, terrace, etc.): Terrace
 Local Relief (concave, convex, none): Concave Slope(%): 3 HGM: N/A
 Subregion (LRR): X Lat: 59.915920 Long: -155.389221 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	70	Yes	FAC	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Vaccinium uliginosum</u>	45	Yes	FAC	OBL species <u> </u> x1= <u> </u>
3. <u>Arctostaphylos alpina</u>	2	No	FAC	FACW species <u>8</u> x2= <u>16</u>
4. <u>Ledum decumbens</u>	2	No	FAC	FAC species <u>124</u> x3= <u>372</u>
5. <u>Vaccinium vitis-idaea</u>	2	No	FAC	FACU species <u>2</u> x4= <u>8</u>
6. <u>Spiraea beauverdiana</u>	2	No	FACU	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>123</u>				Column Totals: <u>134</u> (A) <u>396</u> (B)
50% of total cover: <u>61.5</u>				<u>Prevalence Index = B/A=</u> <u>2.96</u>
20% of total cover: <u>24.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex macrochaeta</u>	7	Yes	FACW	<u>X</u> Dominance Test is >50%
2. <u>Cornus suecica</u>	2	No	FAC	<u>X</u> Prevalence Index is ≤3.0
3. <u>Poa arctica</u>	1	No	FAC	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Hierochloe pauciflora</u>	1	No	FACW	<u> </u> data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>11</u>				
50% of total cover: <u>5.5</u>				
20% of total cover: <u>2.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-11	10YR3/3	100					No	Sandy Loam	hor:B1 10% gravel
11-16	2.5Y 5/4	100					No	Sandy Loam	hor:B2 10% gravel

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>
Type: _____		
Depth (inches): _____		
Field Drainage Class: MWD - Moderately Well Drained		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:		Wetland Hydrology Present? Yes <input type="checkbox"/> X <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input type="checkbox"/> X <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 16.0		
Saturation Present? Yes <input type="checkbox"/> X <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 4.0		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2110_18



Photo Name: Photo_180711081421



Photo Name: Photo_180711081308



Photo Name: Photo_180711081247

Additional Reference Data: Photos

HDR2110_18



Photo Name: Photo_180711081355



Photo Name: Photo_180711081427



Photo Name: Photo_180711081402

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/11/2018
 Applicant/Owner: PLP Sampling Point: HDR2111_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Terrace
 Local Relief (concave, convex, none): Concave Slope(%): _____ HGM: Slope
 Subregion (LRR): X Lat: 59.916039 Long: -155.389572 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1C

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)
 Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ X _____ No _____
 Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No _____
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes <u>X</u>	No _____			

Remarks: W DEST-H adjacent to pond. U DEST 50 feet upslope. Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
4. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
Total Cover: _____				Prevalence Index worksheet:
50% of total cover: <u>0</u>				
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				
1. <u>Vaccinium uliginosum</u>	60	Yes	FAC	Total % Cover of: _____ Multiply by: _____
2. <u>Empetrum nigrum</u>	40	Yes	FAC	OBL species <u>3</u> x1= <u>3</u>
3. <u>Rhododendron tomentosum</u>	20	No	FAC	FACW species <u>24</u> x2= <u>48</u>
4. <u>Betula nana</u>	8	No	FAC	FAC species <u>183</u> x3= <u>549</u>
5. <u>Andromeda polifolia</u>	7	No	FACW	FACU species <u>3</u> x4= <u>12</u>
6. <u>Salix pulchra</u>	5	No	FAC	UPL species _____ x5= _____
Total Cover: <u>153</u>				Column Totals: <u>213</u> (A) <u>612</u> (B)
50% of total cover: <u>76.5</u>				<i>Prevalence Index = B/A =</i> <u>2.87</u>
20% of total cover: <u>30.6</u>				Hydrophytic Vegetation Indicators:
Herb Stratum				X Dominance Test is >50%
1. <u>Carex bigelowii</u>	30	Yes	FAC	X Prevalence Index is ≤3.0
2. <u>Carex microchaeta</u>	10	Yes	FAC	Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet)
3. <u>Rubus chamaemorus</u>	7	No	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)
4. <u>Calamagrostis canadensis</u>	5	No	FAC	
5. <u>Carex saxatilis</u>	5	No	FACW	
6. <u>Eriophorum angustifolium</u>	3	No	OBL	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>60</u>				
50% of total cover: <u>30</u>				
20% of total cover: <u>12</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground _____				
% Cover of Wetland Bryophytes _____ % Cover of Bryophytes _____				
(Where applicable)				

Remarks: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-8									hor:Oe
8-10	10YR2/2	100					No	Sandy Loam	hor:B1 75%gravels
10-16	2.5Y3/3	100					No	Sandy Loam	hor:B2 25%gravels

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> No
Type: _____				
Depth (inches): _____				
Field Drainage Class: PD - Poorly Drained				

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> No
Surface Water Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): 2.0			
Water Table Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): 2.0			
Saturation Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): 0.0			
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position: Adjacent to pond

Additional Reference Data: Overflow Vegetation

HDR2111_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>
<u>Salix fuscescens</u>	<u>5</u>	<u>No</u>	<u>FACW</u>
<u>Spiraea beauverdiana</u>	<u>3</u>	<u>No</u>	<u>FACU</u>

Additional Reference Data: Photos

HDR2111_18



Photo Name: Photo_180711084700



Photo Name: Photo_180711084711



Photo Name: Photo_180711084706



Photo Name: Photo_180711084642



Photo Name: Photo_180711084716

Photo Name: Photo_180711084649



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/11/2018
 Applicant/Owner: PLP Sampling Point: HDR2113_18
 Investigators: MNW AG Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 21 HGM: N/A
 Subregion (LRR): X Lat: 59.915722 Long: -155.387329 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>		
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>		

Remarks: Willows rooted in upland and over hanging the pond on a very steep slope. Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>67</u> (A/B)
20% of total cover: <u>0</u>				
Prevalence Index worksheet:				
<u>Sapling/Shrub Stratum</u>		Total % Cover of: <u> </u> Multiply by:		
1. <u>Salix pulchra</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Alnus sinuata</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>14</u> x2= <u>28</u>
3. <u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	FAC species <u>105</u> x3= <u>315</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>35</u> x4= <u>140</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>154</u> (A) <u>483</u> (B)
Total Cover: <u>70</u>				Prevalence Index = B/A= <u>3.14</u>
50% of total cover: <u>35</u>				
20% of total cover: <u>14</u>				
Hydrophytic Vegetation Indicators:				
<u>Herb Stratum</u>				X Dominance Test is >50%
1. <u>Calamagrostis canadensis</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
2. <u>Thelypteris phegopteris</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
3. <u>Sanguisorba canadensis</u>	<u>12</u>	<u>No</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
4. <u>Chamaenerion angustifolium</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
5. <u>Rubus chamaemorus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>84</u>				
50% of total cover: <u>42</u>				
20% of total cover: <u>16.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				% Bare Ground <u>0</u>
% Cover of Wetland Bryophytes <u>0</u>				% Cover of Bryophytes <u>0</u>
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-4	10YR 5/2	100					N/A	Sandy Loam	hor:B1 Many fine roots
4-7									hor:Oe Buried Oe
7-17	10YR 4/4	100					N/A	Fine Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			
Type: _____			
Depth (inches): _____			
Field Drainage Class: _____			
		Hydric Soil Present?	Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Saturation Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		
	Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:



Photo Name: Photo_180711094328



Photo Name: Photo_180711094312



Photo Name: Photo_180711094333

Additional Reference Data: Photos

HDR2113_18



Photo Name: Photo_180711094252



Photo Name: Photo_180711094223



Photo Name: Photo_180711094320

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/11/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2115_18</u>	
Investigators: <u>MW AG</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>Convex</u>	Slope(%): <u>8</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.915520</u>	Long: <u>-155.387482</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra (DEST)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	

Remarks: Knoll of DEST above pond. Tall bluejoint on steeper surrounding slopes (approx 30%). Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>6</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>67</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Salix pulchra</u>	<u>25</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	FACW species <u>5</u> x2= <u>10</u>
4. <u>Spiraea beauverdia</u>	<u>7</u>	<u>No</u>	<u>FACU</u>	FAC species <u>152</u> x3= <u>456</u>
5. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>20</u> x4= <u>80</u>
6. <u>Rhododendron tomentosum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>138</u>				Column Totals: <u>177</u> (A) <u>546</u> (B)
50% of total cover: <u>69</u>				<u>Prevalence Index = B/A=</u> <u>3.08</u>
20% of total cover: <u>27.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>8</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Cornus canadensis</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Dryopteris expansa</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Rubus chamaemorus</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
7. <u>Chamaenerion angustifolium</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>39</u>				
50% of total cover: <u>19.5</u>				
20% of total cover: <u>7.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>10</u>				Present?
(Where applicable)				

Remarks:

Trace: Ang luc, Lyc ann.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-5									hor:Oi
5-6	2.5Y3/1	100						Sandy Loam	hor:A
6-10									hor:Oe Buried Oe
10-16	7.5YR3/3	100						Sandy Loam	hor:B1
16-20	10YR4/2	100						Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: WD - Well Drained	Hydric Soil Present? Yes _____ No _____ X _____
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Microtopographic Relief (D4)
	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No _____ X _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ X _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ X _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____ X _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Knoll above pond. No water in plot. Grass inundated in pond due to recent heavy rain.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2115_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Vaccinium vitis-idaea	3	No	FAC

Additional Reference Data: Photos

HDR2115_18



Photo Name: Photo_180711102346



Photo Name: Photo_180711102335

Additional Reference Data: Photos

HDR2115_18



Photo Name: Photo_180711103222



Photo Name: Photo_180711103235



Photo Name: Photo_180711103229



Photo Name: Photo_180711103247

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	7/11/2018
Applicant/Owner:	PLP			Sampling Point:	HDR2116_18
Investigators:	MNW AG	Landform (hillslope, terrace, etc.):	Terrace		
Local Relief (concave, convex, none):	Concave	Slope(%):	4	HGM:	N/A
Subregion (LRR):	X	Lat:	59.915745	Long:	-155.388199
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	U		

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-7									hor:Oe
7-8	10 YR 5/2	100					N/A	Sandy Loam	hor:B 50% gravel
8-13	10YR 4/3	100					N/A	Silt Loam	hor:B1 15% gravel
13-15	10YR 4/4	100					N/A	Sandy Loam	25% gravel
15-18	10YR 5/3	100					N/A	Sandy Loam	hor:B2 25% gravel

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: _____	
Depth (inches): _____	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
Field Drainage Class: WD - Well Drained	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
(includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No saturation no water table

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2116_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Solidago multiradiata	2	No	FACU
Anemone richardsonii	1	No	FAC
Viola epipsila	1	No	FAC
Geranium erianthum	1	No	FACU
Linnaea borealis	1	No	FACU
Trientalis europaea	1	No	FACU

Additional Reference Data: Photos

HDR2116_18



Photo Name: Photo_180711105728



Photo Name: Photo_180711105713



Photo Name: Photo_180711105721



Photo Name: Photo_180711105733



Photo Name: Photo_180711105619



Photo Name: Photo_180711105740

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/11/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2117_18</u>	
Investigators: <u>MW AG</u>	Landform (hillslope, terrace, etc.): <u>Terrace</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): _____	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.915024</u>	Long: <u>-155.392685</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Shrub Birch – Willow (SBW)</u>		NWI Classification: <u>PSS1B</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)

Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ X _____ No _____

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>5</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Betula nana</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> _____ <u>Multiply by:</u> _____
2. <u>Salix pulchra</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	OBL species _____ x1= _____
3. <u>Empetrum nigrum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>30</u> x2= <u>60</u>
4. <u>Rhododendron tomentosum</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FAC species <u>140</u> x3= <u>420</u>
5. <u>Vaccinium uliginosum</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACU species <u>10</u> x4= <u>40</u>
6. <u>Spiraea beauverdiana</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	UPL species _____ x5= _____
Total Cover: <u>120</u>				Column Totals: <u>180</u> (A) <u>520</u> (B)
50% of total cover: <u>60</u>				<u>Prevalence Index = B/A=</u> <u>2.89</u>
20% of total cover: <u>24</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Petasites frigidus s.l.</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Rubus chamaemorus</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	Morphological Adaptations ¹ (Provide
4. <u>Carex bigelowii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. _____	_____	_____	_____	Problematic Hydrophytic Vegetation ¹ (Explain)
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>60</u>				
50% of total cover: <u>30</u>				
20% of total cover: <u>12</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes _____		% Cover of Bryophytes _____		
(Where applicable)				
Remarks: _____				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-8									hor:Oe
8-12	10YR2/2	100					No	Sandy Loam	hor:B1 40%gravel
12-20	10YR3/3	100					No	Sandy Loam	hor:B2 10%gravel

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:					

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X				
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:



Photo Name: Photo_180711121753



Photo Name: Photo_180711121739



Photo Name: Photo_180711121802



Photo Name: Photo_180711121817



Photo Name: Photo_180711121745



Photo Name: Photo_180711121719

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/11/2018
 Applicant/Owner: PLP Sampling Point: HDR2118_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Terrace
 Local Relief (concave, convex, none): Concave Slope(%): 5 HGM: Slope
 Subregion (LRR): X Lat: 59.914719 Long: -155.392929 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1B

Vegetation Type: Shrub Birch – Willow (SBW)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>80</u> (A/B)
20% of total cover: <u>0</u>				
Prevalence Index worksheet:				
<u>Sapling/Shrub Stratum</u>		Total % Cover of: <u> </u> Multiply by:		
1. <u>Empetrum nigrum</u>	60	Yes	FAC	OBL species <u> </u> x1= <u> </u>
2. <u>Betula nana</u>	45	Yes	FAC	FACW species <u>13</u> x2= <u>26</u>
3. <u>Salix pulchra</u>	30	Yes	FAC	FAC species <u>172</u> x3= <u>516</u>
4. <u>Vaccinium uliginosum</u>	10	No	FAC	FACU species <u>25</u> x4= <u>100</u>
5. <u>Spiraea beauverdiana</u>	5	No	FACU	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>210</u> (A) <u>642</u> (B)
Total Cover: <u>150</u>				
50% of total cover: <u>75</u>				Prevalence Index = B/A= <u>3.06</u>
20% of total cover: <u>30</u>				
Hydrophytic Vegetation Indicators:				
<u>Herb Stratum</u>				X Dominance Test is >50%
1. <u>Calamagrostis canadensis</u>	20	Yes	FAC	Prevalence Index is ≤3.0
2. <u>Dryopteris expansa</u>	15	Yes	FACU	Morphological Adaptations ¹ (Provide
3. <u>Sanguisorba canadensis</u>	11	No	FACW	data in Remarks or on a separate sheet)
4. <u>Epilobium angustifolium</u>	5	No	FACU	Problematic Hydrophytic Vegetation ¹ (Explain)
5. <u>Carex bigelowii</u>	2	No	FAC	
6. <u>Equisetum arvense</u>	2	No	FAC	
7. <u>Veratrum viride</u>	2	No	FAC	
8. <u>Rubus chamaemorus</u>	2	No	FACW	
9. <u>Aconitum delphinifolium</u>	1	No	FAC	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>60</u>				
50% of total cover: <u>30</u>				
20% of total cover: <u>12</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				% Bare Ground <u>0</u>
% Cover of Wetland Bryophytes <u>10</u>		% Cover of Bryophytes <u>65</u>		
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-5									hor:Oi
5-12									hor:Oe
12-19									hor:Oi
19-20									hor:Oe With inclusions of sand

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: PD - Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 10.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No water table yet. Very slow to weep from pit face.

Geomorphic Position: terrace

Additional Reference Data: Photos

HDR2118_18



Photo Name: Photo_180711125415



Photo Name: Photo_180711125443



Photo Name: Photo_180711125456

Additional Reference Data: Photos

HDR2118_18



Photo Name: Photo_180711125517



Photo Name: Photo_180711125426



Photo Name: Photo_180711125502

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/11/2018
 Applicant/Owner: PLP Sampling Point: HDR2120_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Valleybottom
 Local Relief (concave, convex, none): Concave Slope(%): 1 HGM: N/A
 Subregion (LRR): X Lat: 59.919460 Long: -155.398499 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Closed Willow Tall Shrub (CWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				
1. <u>Salix alaxensis</u>	10	Yes	FAC	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <u> </u>				
3. <u> </u>				
4. <u> </u>				
Total Cover: <u>10</u>				
50% of total cover: <u>5</u>		20% of total cover: <u>2</u>		Prevalence Index worksheet: <u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u> OBL species <u> </u> x1= <u> </u> FACW species <u>10</u> x2= <u>20</u> FAC species <u>161</u> x3= <u>483</u> FACU species <u>5</u> x4= <u>20</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>176</u> (A) <u>523</u> (B) <i>Prevalence Index = B/A=</i> <u>2.97</u>
Sapling/Shrub Stratum				
1. <u>Salix pulchra</u>	90	Yes	FAC	
2. <u>Salix barclayi</u>	15	No	FAC	
3. <u>Salix alaxensis</u>	10	No	FAC	
4. <u> </u>				
5. <u> </u>				
6. <u> </u>				
Total Cover: <u>115</u>				Hydrophytic Vegetation Indicators: X Dominance Test is >50% X Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
50% of total cover: <u>57.5</u>		20% of total cover: <u>23</u>		
Herb Stratum				
1. <u>Calamagrostis canadensis</u>	25	Yes	FAC	
2. <u>Sanguisorba canadensis</u>	10	Yes	FACW	
3. <u>Athyrium americanum</u>	8	No	FAC	
4. <u>Chamaenerion angustifolium</u>	5	No	FACU	
5. <u>Anemone richardsonii</u>	3	No	FAC	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
6. <u> </u>				
7. <u> </u>				
8. <u> </u>				
9. <u> </u>				
10. <u> </u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
Total Cover: <u>51</u>				
50% of total cover: <u>25.5</u>		20% of total cover: <u>10.2</u>		
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>15</u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u>0</u> (Where applicable)				

Remarks:
 Berm features positioned laterally across valley throughout shrub area. Most vegetation is growing on the berms. Trace species: Rub ste, Vio epi, Gal tri, Sax mer, Tri eur.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-20	10YR3/3	100						Silt Loam	hor:B 65% gravel below 14"

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: WD - Well Drained	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)					
<input type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)		
<input type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)		
<input type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input checked="" type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input type="checkbox"/> Microtopographic Relief (D4)		
			<input checked="" type="checkbox"/> FAC-Neutral Test (D5)		

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary hydrology indicators observed. No saturation.

Geomorphic Position: Valley bottom, adjacent to stream



Photo Name: Photo_180711141101



Photo Name: Photo_180711141031



Photo Name: Photo_180711141048

Additional Reference Data: Photos

HDR2120_18



Photo Name: Photo_180711141132



Photo Name: Photo_180711141138



Photo Name: Photo_180711141116

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/11/2018
 Applicant/Owner: PLP Sampling Point: HDR2123_18
 Investigators: MNW AG Landform (hillslope, terrace, etc.): _____
 Local Relief (concave, convex, none): None Slope(%): 2 HGM: N/A
 Subregion (LRR): X Lat: 59.919666 Long: -155.399399 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Willow Tall Shrub (OWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)
 Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes _____	No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>			
Wetland Hydrology Present?	Yes _____	No <u>X</u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>3</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Salix alaxensis</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Salix pulchra</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	OBL species _____ x1= _____
3. <u>Alnus sinuata</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FACW species <u>35</u> x2= <u>70</u>
4. <u>Spiraea stevenii</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	FAC species <u>164</u> x3= <u>492</u>
5. _____	_____	_____	_____	FACU species <u>9</u> x4= <u>36</u>
6. _____	_____	_____	_____	UPL species _____ x5= _____
Total Cover: <u>63</u>				Column Totals: <u>208</u> (A) <u>598</u> (B)
50% of total cover: <u>31.5</u>				Prevalence Index = B/A= <u>2.88</u>
20% of total cover: <u>12.6</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Sanguisorba canadensis</u>	<u>35</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Rubus arcticus</u> s.l.	<u>11</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Viola epipsila</u>	<u>7</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Dryopteris expansa</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Anemone richardsonii</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
7. <u>Equisetum arvense</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Geranium erianthum</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	must be present, unless disturbed or problematic.
9. <u>Trientalis europaea</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
10. _____	_____	_____	_____	
Total Cover: <u>145</u>				
50% of total cover: <u>72.5</u>				
20% of total cover: <u>29</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				Hydrophytic
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u>0</u>				Vegetation
(Where applicable)				Yes <u>X</u> No _____
				Present?
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-5									hor:Oi
5-8	10YR 3/3	100						Fine Sandy Loam	hor:B1
8-16	10YR 3/2	100					N/A	Silt Loam	hor:B2 Cobbles starting at 8"

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
Type: _____		
Depth (inches): _____		
Field Drainage Class: WD - Well Drained		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Saturation Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No water table or saturation

Geomorphic Position:

Additional Reference Data: Photos

HDR2123_18



Photo Name: Photo_180711145718



Photo Name: Photo_180711145758



Photo Name: Photo_180711145706



Photo Name: Photo_180711145842



Photo Name: Photo_180711145835



Photo Name: Photo_180711145819

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/11/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2124_18</u>	
Investigators: <u>MW AG</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>1</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.919888</u>	Long: <u>-155.400375</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Closed Willow Tall Shrub (CWTS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>2</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>90</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Alnus sinuata</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Spiraea beauverdiana</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	FACW species <u>15</u> x2= <u>30</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>178</u> x3= <u>534</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>9</u> x4= <u>36</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>98</u>				Column Totals: <u>202</u> (A) <u>600</u> (B)
50% of total cover: <u>49</u>				<u>Prevalence Index = B/A=</u> <u>2.97</u>
20% of total cover: <u>19.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Sanguisorba canadensis</u>	<u>15</u>	<u>No</u>	<u>FACW</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Rubus arcticus s.l.</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Chamaenerion angustifolium</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Galium boreale</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Geranium erianthum</u>	<u> </u>	<u>No</u>	<u>FACU</u>	
8. <u>Gymnocarpium dryopteris</u>	<u> </u>	<u>No</u>	<u>FACU</u>	
9. <u>Streptopus amplexifolius</u>	<u> </u>	<u>No</u>	<u>FACU</u>	
10. <u>Trientalis europaea</u>	<u> </u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>104</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>52</u>				
20% of total cover: <u>20.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>5</u>				
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes ⁰ <u> </u>				
(Where applicable)				
Remarks:				
Trace: Str amp, Ger eri, Gym dry, Tri eur.				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-8	10YR3/3	100						Fine Sandy Loam	hor:B1
8-15	10YR4/3	100						Sandy Loam	hor:B2 Cobbles at 9"

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
Type: _____		
Depth (inches): _____		
Field Drainage Class: WD - Well Drained		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Saturation Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydrology indicators observed.

Geomorphic Position:

Additional Reference Data: Photos

HDR2124_18



Photo Name: Photo_180711154353



Photo Name: Photo_180711154440



Photo Name: Photo_180711154451

Additional Reference Data: Photos

HDR2124_18



Photo Name: Photo_180711154446



Photo Name: Photo_180711154417



Photo Name: Photo_180711154433

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/12/2018
 Applicant/Owner: PLP Sampling Point: HDR2125_18
 Investigators: MNW AG Landform (hillslope, terrace, etc.): Terrace
 Local Relief (concave, convex, none): None Slope(%): 0 HGM: N/A
 Subregion (LRR): X Lat: 59.921398 Long: -155.379334 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	

Remarks: No evidence of overland flooding. Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>75</u> (A/B)
20% of total cover: <u>0</u>				
Prevalence Index worksheet:				
Total % Cover of:		Multiply by:		
OBL species	<u> </u>	x1=	<u> </u>	
FACW species	<u>7</u>	x2=	<u>14</u>	
FAC species	<u>114</u>	x3=	<u>342</u>	
FACU species	<u>48</u>	x4=	<u>192</u>	
UPL species	<u> </u>	x5=	<u> </u>	
Column Totals:	<u>169</u> (A)		<u>548</u> (B)	
Prevalence Index = B/A=				<u>3.24</u>
Hydrophytic Vegetation Indicators:				
X Dominance Test is >50%				
Prevalence Index is ≤3.0				
Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet)				
Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>				

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Salix pulchra</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Salix barclayi</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Empetrum nigrum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
4. <u>Salix alaxensis</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
5. <u>Populus balsamifera</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
6. <u>Alnus sinuata</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>73</u>				
50% of total cover: <u>36.5</u>				
20% of total cover: <u>14.6</u>				
Herb Stratum				
1. <u>Calamagrostis canadensis</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Epilobium angustifolium</u>	<u>25</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Equisetum arvense</u>	<u>12</u>	<u>No</u>	<u>FAC</u>	
4. <u>Trientalis europaea</u>	<u>7</u>	<u>No</u>	<u>FACU</u>	
5. <u>Sanguisorba canadensis</u>	<u>6</u>	<u>No</u>	<u>FACW</u>	
6. <u>Rubus arcticus s.l.</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
7. <u>Heracleum maximum</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
8. <u>Viola epipsila</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
9. <u>Achillea millefolium s.l.</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
10. <u>Angelica lucida</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>96</u>				
50% of total cover: <u>48</u>				
20% of total cover: <u>19.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u>65</u>				
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-4	10YR 3/3	100					N/A	Fine Sandy Loam	hor:B1
4-8							N/A		hor:Oe Oeb
8-16	10YR 4/4	100					N/A	Sand	hor:B2 *4

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: _____	
Depth (inches): _____	Hydric Soil Present? Yes _____ No _____ X
Field Drainage Class: MWD - Moderately Well Drained	

Remarks: *4: 40% cobbles. Variegated redox staining on some cobbles

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	
Surface Water Present? Yes _____ No _____ X Depth (inches): _____	Wetland Hydrology Present? Yes _____ No _____ X
Water Table Present? Yes _____ No _____ X Depth (inches): _____	
Saturation Present? Yes _____ No _____ X Depth (inches): _____	
(includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydrology indicators observed.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2125_18

	Absolute % Cover	Dominant Species?	Indicator Status
Herb			
Geranium erianthum	2	No	FACU
Pyrola asarifolia	2	No	FACU
Aconitum delphiniifolium	1	No	FAC
Poa arctica	1	No	FAC
Pedicularis langsdorfii	1	No	FACW
Sapling/Shrub			
Vaccinium uliginosum	1	No	FAC

Additional Reference Data: Photos

HDR2125_18



Photo Name: Photo_180712082329



Photo Name: Photo_180712082231

Additional Reference Data: Photos

HDR2125_18



Photo Name: Photo_180712082244



Photo Name: Photo_180712082308



Photo Name: Photo_180712082336



Photo Name: Photo_180712082343

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/12/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2127_18</u>	
Investigators: <u>MW AG</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): _____	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.923691</u>	Long: <u>-155.380096</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
		NWI Classification: <u>U</u>

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)

Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>		
Wetland Hydrology Present? Yes <u>X</u> No _____		

Remarks: Swale. DEST-H with two photosignatures, areas with more Cal can and areas without. 3PP plot is on boundary between the two. Both veg types captured in HDR plot. Entire area is U DEST-H. Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>5</u> (B)
4. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
Total Cover: _____				Prevalence Index worksheet:
50% of total cover: <u>0</u>				Total % Cover of: _____ Multiply by: _____
20% of total cover: <u>0</u>				OBL species <u> </u> x1= _____
Sapling/Shrub Stratum				FACW species <u>10</u> x2= <u>20</u>
1. <u>Empetrum nigrum</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	FAC species <u>166</u> x3= <u>498</u>
2. <u>Vaccinium uliginosum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	FACU species <u>26</u> x4= <u>104</u>
3. <u>Spiraea beauverdana</u>	<u>15</u>	<u>No</u>	<u>FACU</u>	UPL species _____ x5= _____
4. _____	_____	_____	_____	Column Totals: <u>202</u> (A) <u>622</u> (B)
5. _____	_____	_____	_____	Prevalence Index = B/A= <u>3.08</u>
6. _____	_____	_____	_____	Hydrophytic Vegetation Indicators:
Total Cover: <u>125</u>				<u>X</u> Dominance Test is >50%
50% of total cover: <u>62.5</u>				Prevalence Index is ≤3.0
20% of total cover: <u>25</u>				Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet)
Herb Stratum				Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Calamagrostis canadensis</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Carex microchaeta</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	
4. <u>Chamaenerion angustifolium</u>	<u>8</u>	<u>No</u>	<u>FACU</u>	
5. <u>Iris setosa</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
6. <u>Rubus arcticus s.l.</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
7. <u>Veratrum viride</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
8. <u>Cornus canadensis</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>77</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
50% of total cover: <u>38.5</u>				
20% of total cover: <u>15.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes ⁵ _____				
(Where applicable)				

Remarks:

Trace: Tri eur.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-5									hor:Oe
5-8	7.5YR3/3	100						Fine Sandy Loam	hor:B1
8-20	10YR3/6	100						Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: _____	
Depth (inches): _____	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Field Drainage Class: MWD - Moderately Well Drained	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
(includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No saturation or water table observed. Hummocks are present.

Geomorphic Position:



Photo Name: Photo_180712092353



Photo Name: Photo_180712092343



Photo Name: Photo_180712092422



Photo Name: Photo_180712092401



Photo Name: Photo_180712092407



Photo Name: Photo_180712092310

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/12/2018
 Applicant/Owner: PLP Sampling Point: HDR2130_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Footslope
 Local Relief (concave, convex, none): Concave Slope(%): 2 HGM: N/A
 Subregion (LRR): X Lat: 59.925621 Long: -155.370499 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	

Remarks: Swale above stream. Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Vaccinium uliginosum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Ledum decumbens</u>	<u>16</u>	<u>No</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
4. <u>Salix pulchra</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FAC species <u>183</u> x3= <u>549</u>
5. <u>Spiraea beauverdiana</u>	<u>15</u>	<u>No</u>	<u>FACU</u>	FACU species <u>16</u> x4= <u>64</u>
6. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>166</u>				Column Totals: <u>199</u> (A) <u>613</u> (B)
50% of total cover: <u>83</u>				Prevalence Index = B/A= <u>3.08</u>
20% of total cover: <u>33.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>18</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Carex microchaeta</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Cornus suecica</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Equisetum arvense</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Epilobium angustifolium</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>33</u>				
50% of total cover: <u>16.5</u>				
20% of total cover: <u>6.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>10</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>40</u>				Present?
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-5									hor:Oe
5-14	10YR 5/2	80	7.5YR 4/4	20	C	PL RC	No	Fine Sandy Loam	hor:B1
14-16	2.5Y 5/3	95	5YR 4/6	5	C		No	Silt Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:
☐ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:
☐ Alaska Color Change (TA4)⁴
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox With 2.5Y Hue

☐ Alaska Gleyed Without Hue 5Y or Redder
☐ Underlying Layer
☐ Other (Explain in Remarks)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

Restrictive Layer (if present):
Type: _____
Depth (inches): _____
Field Drainage Class: SPD - Somewhat Poorly Drained

Hydric Soil Present? Yes No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)
☐ Surface Water (A1)
☐ High Water Table (A2)
☐ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Marl Deposits (B15)
☐ Hydrogen Sulfide Odor (C1)
☐ Dry Season Water Table (C2)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)
☐ Water-stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ Microtopographic Relief (D4)
☐ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes No X Depth (inches): _____
Water Table Present? Yes No X Depth (inches): _____
Saturation Present? Yes No X Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No saturation or water table observed.

Geomorphic Position:

Additional Reference Data: Photos

HDR2130_18



Photo Name: Photo_180712102517



Photo Name: Photo_180712102505



Photo Name: Photo_180712102553

Additional Reference Data: Photos

HDR2130_18



Photo Name: Photo_180712102534



Photo Name: Photo_180712102547



Photo Name: Photo_180712102600

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/12/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2131_18</u>	
Investigators: <u>MW AG</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>3</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.925346</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		

Remarks: Narrow (15') fringe of emergent wetland with evidence of beaver modification (abandoned lodge). Located at toeslope of small rise. Use contours to limit wetland to toeslope. Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>6</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>8</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>75</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Salix pulchra</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>6</u> x2= <u>12</u>
4. <u>Betula nana</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FAC species <u>161</u> x3= <u>483</u>
5. <u>Salix barclayi</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACU species <u>25</u> x4= <u>100</u>
6. <u>Rhododendron tomentosum</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>140</u>				Column Totals: <u>192</u> (A) <u>595</u> (B)
50% of total cover: <u>70</u>				<u>Prevalence Index = B/A=</u> <u>3.10</u>
20% of total cover: <u>28</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Chamaenerion angustifolium</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Carex bigelowii</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Pyrola asarifolia</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Rubus arcticus s.l.</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
7. <u>Cornus canadensis</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
8. <u>Carex canescens</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	
9. <u>Eriophorum russeolum s.l.</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>52</u>				
50% of total cover: <u>26</u>				
20% of total cover: <u>10.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>5</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>15</u>				Present?
(Where applicable)				

Remarks:

Trace: Sal fus, Vac vit, Tri eur, Pyr min.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-8									hor:Oe
8-18	10YR2/2	100					No	Sandy Loam	hor:B1 *3
18-22	2.5Y4/1	100					No	Sandy Loam	hor:B2 *4

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydic Soil Indicators:			Indicators for Problematic Hydic Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydic Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	PD - Poorly Drained				

Remarks: *3: Cobble layer at 8" and 30% gravels below. Positive alpha alpha rxn after 5 min *4: Positive alpha alpha rxn after 5min

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> X No	
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):		
Water Table Present?	Yes <input checked="" type="checkbox"/> X No <input type="checkbox"/> Depth (inches):		
Saturation Present?	Yes <input checked="" type="checkbox"/> X No <input type="checkbox"/> Depth (inches):		
(includes capillary fringe)			

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

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	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Spiraea beauverdiana</u>	<u>7</u>	<u>No</u>	<u>FACU</u>
<u>Salix alaxensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>

Additional Reference Data: Photos

HDR2131_18



Photo Name: Photo_180712113429



Photo Name: Photo_180712111116

Additional Reference Data: Photos

HDR2131_18



Photo Name: Photo_180712111121



Photo Name: Photo_180712113424



Photo Name: Photo_180712113434

Photo Name: Photo_180712113438



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/12/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2132_18</u>	
Investigators: <u>MNW AG</u>	Landform (hillslope, terrace, etc.): <u>Valleybottom</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>3</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.924801</u>	Long: <u>-155.365173</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Soil Map Unit Name: <u>N/A</u>		NWI Classification: <u>U</u>

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Salix pulchra</u>	<u>25</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium uliginosum</u>	<u>25</u>	<u>No</u>	<u>FAC</u>	FACW species <u>4</u> x2= <u>8</u>
4. <u>Ledum decumbens</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>175</u> x3= <u>525</u>
5. <u>Vaccinium vitis-idaea</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FACU species <u>7</u> x4= <u>28</u>
6. <u>Betula nana</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>142</u>				Column Totals: <u>186</u> (A) <u>561</u> (B)
50% of total cover: <u>71</u>				<u>Prevalence Index = B/A=</u> <u>3.02</u>
20% of total cover: <u>28.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Carex microchaeta</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Chamaenerion angustifolium</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Geranium erianthum</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
7. <u>Rubus chamaemorus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Sanguisorba canadensis</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	must be present, unless disturbed or problematic.
9. <u>Sedum rosea ssp. integrifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u>Pedicularis capitata</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>44</u>				
50% of total cover: <u>22</u>				
20% of total cover: <u>8.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>5</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>40</u>				Present?
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-6									hor:Oe
6-20	10YR 4/2	100					No	Silt Loam	hor:B *3

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: MWD - Moderately Well Drained	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X
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Remarks: *3: 10" x 12" cobble excavated from pit

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 20.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 14.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydrology indicators observed.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2132_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Spiraea stevenii</u>	<u>2</u>	<u>No</u>	<u>FACU</u>

Additional Reference Data: Photos

HDR2132_18



Photo Name: Photo_180712122204



Photo Name: Photo_180712122255

Additional Reference Data: Photos

HDR2132_18



Photo Name: Photo_180712122226



Photo Name: Photo_180712122209



Photo Name: Photo_180712122240

Photo Name: Photo_180712122246



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/12/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2133_18</u>	
Investigators: <u>MW AG</u>	Landform (hillslope, terrace, etc.): <u>Valleybottom</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>2</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.924721</u>	Long: <u>-155.364410</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Open Willow Low Shrub (OWLS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>OWLS in valley bottom, outside floodplain of stream. Floodplain is 3' lower in elevation than plot. Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>60</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>65</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Spiraea stevenii</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Empetrum nigrum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FACW species <u>12</u> x2= <u>24</u>
4. <u>Vaccinium vitis-idaea</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FAC species <u>114</u> x3= <u>342</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>56</u> x4= <u>224</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>81</u>				Column Totals: <u>182</u> (A) <u>590</u> (B)
50% of total cover: <u>40.5</u>				<u>Prevalence Index = B/A=</u> <u>3.24</u>
20% of total cover: <u>16.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Chamaenerion angustifolium</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Geranium erianthum</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Sanguisorba canadensis</u>	<u>12</u>	<u>Yes</u>	<u>FACW</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Equisetum arvense</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Dryopteris expansa</u>	<u>8</u>	<u>No</u>	<u>FACU</u>	
7. <u>Anemone richardsonii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Rubus arcticus s.l.</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Viola epipsila</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
10. <u>Galium boreale</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>101</u>				
50% of total cover: <u>50.5</u>				
20% of total cover: <u>20.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>10</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>10</u>				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-15	10YR2/2	85					No	Sandy Loam	hor:B1 *2
3-15	2.5Y3/3	15					No	Sandy Loam	hor:B1 *3
15-16	2.5YR2.5/2	100					No	Sandy Loam	hor:B2
16-20	10YR3/3	100					No	Sand	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: MWD - Moderately Well Drained	Hydric Soil Present? Yes _____ No _____ X _____
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Remarks: *2: Second matrix color (2.5Y3/3) is inclusions of sand *3: Second matrix color (2.5Y3/3) is inclusions of sand

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	<input type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Shallow Aquitard (D3)	<input type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> FAC-Neutral Test (D5)			
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)				
<input type="checkbox"/> Algal Mat or Crust (B4)					
<input type="checkbox"/> Iron Deposits (B5)					
<input type="checkbox"/> Surface Soil Cracks (B6)					
Field Observations: Surface Water Present? Yes _____ No _____ X _____ Depth (inches): _____ Water Table Present? Yes _____ X _____ No _____ Depth (inches): 17.0 Saturation Present? Yes _____ X _____ No _____ Depth (inches): 13.0 (includes capillary fringe)			Wetland Hydrology Present? Yes _____ No _____ X _____		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydrology indicators observed.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2133_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Pyrola minor	3	No	FAC
Trientalis europaea	3	No	FACU

Additional Reference Data: Photos

HDR2133_18



Photo Name: Photo_180712130143



Photo Name: Photo_180712130205

Additional Reference Data: Photos

HDR2133_18



Photo Name: Photo_180712130105



Photo Name: Photo_180712130158



Photo Name: Photo_180712130149



Photo Name: Photo_180712130211

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/12/2018
 Applicant/Owner: PLP Sampling Point: HDR2134_18
 Investigators: MNW AG Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 4 HGM: Slope
 Subregion (LRR): X Lat: 59.920509 Long: -155.360153 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/EM1B

Vegetation Type: Ericaceous Shrub Bog (ESB)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Prevalence Index worksheet:				
<u>Sapling/Shrub Stratum</u>		Total % Cover of: <u> </u> Multiply by:		
1. <u>Empetrum nigrum</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>30</u> x1= <u>30</u>
2. <u>Vaccinium uliginosum</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>15</u> x2= <u>30</u>
3. <u>Betula nana</u>	<u>12</u>	<u>No</u>	<u>FAC</u>	FAC species <u>89</u> x3= <u>267</u>
4. <u>Salix fuscescens</u>	<u>7</u>	<u>No</u>	<u>FACW</u>	FACU species <u>4</u> x4= <u>16</u>
5. <u>Ledum decumbens</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
6. <u>Spiraea stevenii</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	Column Totals: <u>138</u> (A) <u>343</u> (B)
Total Cover: <u>97</u>				
50% of total cover: <u>48.5</u>				Prevalence Index = B/A= <u>2.49</u>
20% of total cover: <u>19.4</u>				
Hydrophytic Vegetation Indicators:				
1. <u>Carex pluriflora</u> <u>22</u> <u>Yes</u> <u>OBL</u>				X Dominance Test is >50%
2. <u>Eriophorum angustifolium</u> <u>8</u> <u>No</u> <u>OBL</u>				X Prevalence Index is ≤3.0
3. <u>Rubus chamaemorus</u> <u>7</u> <u>No</u> <u>FACW</u>				Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u> <u>2</u> <u>No</u> <u>FAC</u>				data in Remarks or on a separate sheet)
5. <u>Lycopodium annotinum s.l.</u> <u>1</u> <u>No</u> <u>FACU</u>				Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Trientalis europaea</u> <u>1</u> <u>No</u> <u>FACU</u>				
7. <u> </u> <u> </u> <u> </u> <u> </u>				
8. <u> </u> <u> </u> <u> </u> <u> </u>				
9. <u> </u> <u> </u> <u> </u> <u> </u>				
10. <u> </u> <u> </u> <u> </u> <u> </u>				
Total Cover: <u>41</u>				
50% of total cover: <u>20.5</u>				
20% of total cover: <u>8.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>40</u>				
% Cover of Bryophytes <u>50</u>				
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-22									hor:Oe *2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	PD - Poorly Drained				

Remarks: *2: Inclusions of fine sand at @8 inches

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):				
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):				
Saturation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Water slow to enter the hole, water table depth estimated based on source of water filling the hole.
Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2134_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Cornus suecica	1	No	FAC
Andromeda polifolia	1	No	FACW

Additional Reference Data: Photos

HDR2134_18



Photo Name: Photo_180712140301



Photo Name: Photo_180712140244

Additional Reference Data: Photos

HDR2134_18



Photo Name: Photo_180712140311



Photo Name: Photo_180712140323



Photo Name: Photo_180712140223

Photo Name: Photo_180712140122



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/12/2018
 Applicant/Owner: PLP Sampling Point: HDR2135_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): Convex Slope(%): 5 HGM: Slope
 Subregion (LRR): X Lat: 59.920467 Long: -155.359100 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS3/1B

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation.</u>					

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	80	Yes	FAC	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Betula nana</u>	50	Yes	FAC	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium uliginosum</u>	30	No	FAC	FACW species <u>10</u> x2= <u>20</u>
4. <u>Rhododendron tomentosum</u>	10	No	FAC	FAC species <u>205</u> x3= <u>615</u>
5. <u>Salix pulchra</u>	5	No	FAC	FACU species <u>5</u> x4= <u>20</u>
6. <u>Vaccinium vitis-idaea</u>	5	No	FAC	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>185</u>				Column Totals: <u>220</u> (A) <u>655</u> (B)
50% of total cover: <u>92.5</u>				<u>Prevalence Index = B/A=</u> <u>2.98</u>
20% of total cover: <u>37</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	15	Yes	FAC	<u>X</u> Dominance Test is >50%
2. <u>Carex microchaeta</u>	10	Yes	FAC	<u>X</u> Prevalence Index is ≤3.0
3. <u>Rubus chamaemorus</u>	10	Yes	FACW	<u> </u> Morphological Adaptations ¹ (Provide
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>35</u>				
50% of total cover: <u>17.5</u>				
20% of total cover: <u>7</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes <u>5</u>				
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-9									hor:Oe
9-11	10YR3/2	100					Yes	Sandy Loam	hor:B1 80% cobbles
11-18	10YR3/1	100					Yes	Silt Loam	hor:B2 H2S at 11"

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: PD - Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 8.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2135_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>

Additional Reference Data: Photos

HDR2135_18



Photo Name: Photo_180712145451



Photo Name: Photo_180712145402

Additional Reference Data: Photos

HDR2135_18



Photo Name: Photo_180712145441



Photo Name: Photo_180712145435



Photo Name: Photo_180712145417



Photo Name: Photo_180712145428

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/12/2018
 Applicant/Owner: PLP Sampling Point: HDR2136_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): Convex Slope(%): 4 HGM: N/A
 Subregion (LRR): X Lat: 59.920643 Long: -155.359192 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Salix pulchra</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
4. <u>Betula glandulosa</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>138</u> x3= <u>414</u>
5. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>3</u> x4= <u>12</u>
6. <u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>128</u>				Column Totals: <u>141</u> (A) <u>426</u> (B)
50% of total cover: <u>64</u>				Prevalence Index = B/A= <u>3.02</u>
20% of total cover: <u>25.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex microchaeta</u>	<u>8</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Morphological Adaptations ¹ (Provide
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>13</u>				
50% of total cover: <u>6.5</u>				
20% of total cover: <u>2.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>20</u>				Vegetation
% Cover of Wetland Bryophytes <u>1</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes ⁵ <u> </u>				Present?
(Where applicable)				
Remarks: <u>Bare ground is cobbles and low spots. One patch of Sphagnum in low spot. Lichen 10%</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-8									hor:Oe
8-20									hor:C Cobbles. No soil development

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydic Soil Indicators:			Indicators for Problematic Hydic Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: SED - Somewhat Excessively Drained	Hydic Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
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Remarks: Organic above cobbles. No soil development below 8"

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary hydrology indicators observed.

Geomorphic Position: Toeslope, adjacent wetland and pond

Additional Reference Data: Overflow Vegetation

HDR2136_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Loiseleuria procumbens</u>	<u>3</u>	<u>No</u>	<u>FACU</u>

Additional Reference Data: Photos

HDR2136_18



Photo Name: Photo_180712153817



Photo Name: Photo_180712153823

Additional Reference Data: Photos

HDR2136_18



Photo Name: Photo_180712153831



Photo Name: Photo_180712153810



Photo Name: Photo_180712152726

Photo Name: Photo_180712152745



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2019 Borough/City: Lake and Peninsula Sampling Date: 7/12/2018
 Applicant/Owner: PLP Sampling Point: HDR2137_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 7 HGM: Slope
 Subregion (LRR): X Lat: 59.920860 Long: -155.360046 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS3/1B

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
<u>Tree Stratum</u>				Number of Dominant Species
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Percent of Dominant Species
Total Cover: <u> </u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		Prevalence Index Worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Empetrum nigrum</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Betula nana</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
3. <u>Vaccinium uliginosum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	FAC species <u>173</u> x3= <u>519</u>
4. <u>Salix pulchra</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	FACU species <u>10</u> x4= <u>40</u>
5. <u>Spiraea stevenii</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	UPL species <u> </u> x5= <u> </u>
6. <u>Rhododendron tomentosum</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	Column Totals: <u>183</u> (A) <u>559</u> (B)
Total Cover: <u>168</u>				<u>Prevalence Index = B/A=</u> <u>3.05</u>
50% of total cover: <u>84</u>		20% of total cover: <u>33.6</u>		Hydrophytic Vegetation Indicators:
<u>Herb Stratum</u>				<u>X</u> Dominance Test is >50%
1. <u>Carex microchaeta</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Prevalence Index is ≤3.0
2. <u>Cornus suecica</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	data in Remarks or on a separate sheet)
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>15</u>				Hydrophytic
50% of total cover: <u>7.5</u>		20% of total cover: <u>3</u>		Vegetation
Plot size (radius, or length x width) <u>1/10 acre</u>		% Bare Ground <u>5</u>		Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u>0</u>		% Cover of Bryophytes <u>5</u>		Present?
(Where applicable)				

Remarks: Lichen 10%

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-12	10YR3/3	65	10YR3/4	35	C	M	No	Fine Sandy Loam	hor:B1
12-14	2.5Y4/3	90	5YR4/4	10	C	M	No	Fine Sand	hor:B2
14-15	5YR4/6	100					No	Sandy Loam	hor:B
15-20	2.5Y4/3	100					No	Fine Sand	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:

☐ Histosol or Histel (A1)

☐ Histic Epipedon (A2)

☐ Hydrogen Sulfide (A4)

☐ Thick Dark Surface (A12)

☐ Alaska Gleyed (A13)

☐ Alaska Redox (A14)

☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:

☐ Alaska Color Change (TA4)⁴

☐ Alaska Alpine Swales (TA5)

☒ Alaska Redox With 2.5Y Hue

☐ Alaska Gleyed Without Hue 5Y or Redder

☐ Underlying Layer

☐ Other (Explain in Remarks)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

Restrictive Layer (if present):
Type: _____
Depth (inches): _____
Field Drainage Class: WD - Well Drained

Hydric Soil Present? Yes ☒ No _____

Remarks: Soil pit excavated in small swale.

Added "surface water present" in hydrology based on photographs. Because plot now has primary hydrology, hydrophytic vegetation, and an appropriate landscape position, the plot meets the problematic hydric soil indicator Alaska Redox With 2.5Y Hue - MS 8/9/19

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)

☒ Surface Water (A1)

☐ High Water Table (A2)

☐ Saturation (A3)

☐ Water Marks (B1)

☐ Sediment Deposits (B2)

☐ Drift Deposits (B3)

☐ Algal Mat or Crust (B4)

☐ Iron Deposits (B5)

☐ Surface Soil Cracks (B6)

☐ Inundation Visible on Aerial Imagery (B7)

☐ Sparsely Vegetated Concave Surface (B8)

☐ Marl Deposits (B15)

☐ Hydrogen Sulfide Odor (C1)

☐ Dry Season Water Table (C2)

☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

☐ Water-stained Leaves (B9)

☐ Drainage Patterns (B10)

☐ Oxidized Rhizospheres along Living Roots (C3)

☐ Presence of Reduced Iron (C4)

☐ Salt Deposits (C5)

☐ Stunted or Stressed Plants (D1)

☒ Geomorphic Position (D2)

☐ Shallow Aquitard (D3)

☐ Microtopographic Relief (D4)

☐ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ☒ No _____ Depth (inches): 3.0
Water Table Present? Yes _____ No ☒ Depth (inches): _____
Saturation Present? Yes _____ No ☒ Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators of wetland hydrology. Bare cobbles with standing water nearby downslope, water likely infiltrates quickly.

Added "surface water present" and geomorphic position based on photographs - MS 8/9/19

Geomorphic Position: Toeslope

Additional Reference Data: Photos

HDR2137_18



Photo Name: Photo_180712160806



Photo Name: Photo_180712160811



Photo Name: Photo_180712160816

Additional Reference Data: Photos

HDR2137_18



Photo Name: Photo_180712160720



Photo Name: Photo_180712160737



Photo Name: Photo_180712160759

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/13/2018
 Applicant/Owner: PLP Sampling Point: HDR2138b_18
 Investigators: MNW AG Landform (hillslope, terrace, etc.): _____
 Local Relief (concave, convex, none): Concave Slope(%): 1 HGM: N/A
 Subregion (LRR): X Lat: 59.932461 Long: -155.385315 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Closed Willow Low Shrub (CWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)
 Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ X _____ No _____
 Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes _____	No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>			
Wetland Hydrology Present?	Yes _____	No <u>X</u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>3</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>67</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>76</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. _____	_____	_____	_____	OBL species _____ x1= _____
3. _____	_____	_____	_____	FACW species <u>12</u> x2= <u>24</u>
4. _____	_____	_____	_____	FAC species <u>127</u> x3= <u>381</u>
5. _____	_____	_____	_____	FACU species <u>18</u> x4= <u>72</u>
6. _____	_____	_____	_____	UPL species _____ x5= _____
Total Cover: <u>76</u>				Column Totals: <u>157</u> (A) <u>477</u> (B)
50% of total cover: <u>38</u>				Prevalence Index = B/A= <u>3.04</u>
20% of total cover: <u>15.2</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>28</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Epilobium angustifolium</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>12</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Sanguisorba canadensis</u>	<u>12</u>	<u>No</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
5. <u>Sedum rosea ssp. integrifolium</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Polemonium acutiflorum</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
7. <u>Viola epipsila</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Carex brunnescens</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Cerastium arvense</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u>Achillea millefolium s.l.</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>82</u>				
50% of total cover: <u>41</u>				
20% of total cover: <u>16.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>O</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No _____
% Cover of Bryophytes <u>10</u>				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-3									hor:Oe
3-7	10YR 3/2	100					N/A	Silt Loam	hor:B1
7-20	10 YR 3/3	100					N/A	Sandy Loam	hor:B2 55% gravel starts at 7"

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	
Type: _____		Yes	No
Depth (inches): _____			X
Field Drainage Class: WD - Well Drained			

Remarks: No indicators

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Yes	No
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X		X
Saturation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X		
(includes capillary fringe)	Depth (inches): _____		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No saturation or water table

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2138b_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Galium boreale	1	No	FACU
Trientalis europaea	1	No	FACU
Carex sp.	1	No	N/A

Additional Reference Data: Photos

HDR2138b_18



Photo Name: Photo_180713075356



Photo Name: Photo_180713075345

Additional Reference Data: Photos

HDR2138b_18

Photo Name: Photo_180713075424



Photo Name: Photo_180713075337



Photo Name: Photo_180713075405



Additional Reference Data: Photos

HDR2138b_18



Photo Name: Photo_180713075417

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/13/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2142_18</u>	
Investigators: <u>MNW AG</u>	Landform (hillslope, terrace, etc.): <u>Terrace</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>1</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.931007</u>	Long: <u>-155.382675</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Open Willow Low Shrub (OWLS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>			20% of total cover: <u>0</u>	That Are OBL, FACW, or FAC: <u>75</u> (A/B)
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>37</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Empetrum nigrum</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium uliginosum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>3</u> x2= <u>6</u>
4. <u>Vaccinium vitis-idaea</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FAC species <u>97</u> x3= <u>291</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>56</u> x4= <u>224</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>59</u>				Column Totals: <u>156</u> (A) <u>521</u> (B)
50% of total cover: <u>29.5</u>			20% of total cover: <u>11.8</u>	<u>Prevalence Index = B/A=</u> <u>3.34</u>
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Epilobium angustifolium</u>	<u>40</u>	<u>Yes</u>	<u>FACU</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>21</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Solidago multiradiata</u>	<u>6</u>	<u>No</u>	<u>FACU</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Viola epipsila</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Luzula parviflora</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Geranium erianthum</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Pyrola asarifolia</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
8. <u>Poa arctica</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
9. <u>Sedum rosea ssp. integrifolium</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
10. <u>Galium boreale</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>97</u>				Hydrophytic
50% of total cover: <u>48.5</u>			20% of total cover: <u>19.4</u>	Vegetation
Plot size (radius, or length x width) <u>1/10 acre</u>			% Bare Ground <u>0</u>	Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u>0</u>	% Cover of Bryophytes <u>35</u>			Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oe
2-4	10YR 3/2	100						Silt Loam	hor:A Cobbles starting at 2"
4-8	10YR 4/2							Silt Loam	hor:B
8-15	10YR 4/4	100						Fine Sandy Loam	hor:B1
15-18	7.5 YR 4/6	100						Fine Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
Type: _____		
Depth (inches): _____		
Field Drainage Class: WD - Well Drained		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Saturation Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No water table or saturation.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2142_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Rubus chamaemorus	2	No	FACW
Aconitum delphiniifolium	1	No	FAC
Cerastium arvense	1	No	FAC
Fritillaria camschatcensis	1	No	FAC
Polemonium acutiflorum	1	No	FAC
Valeriana capitata	1	No	FAC
Angelica lucida	1	No	FACU
Trientalis europaea	1	No	FACU
Carex mertensii	1	No	FACW

Additional Reference Data: Photos

HDR2142_18



Photo Name: Photo_180713090052



Photo Name: Photo_180713090124



Photo Name: Photo_180713090117



Photo Name: Photo_180713090138



Photo Name: Photo_180713090034



Photo Name: Photo_180713090130

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/13/2018
 Applicant/Owner: PLP Sampling Point: HDR2143_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Swale
 Local Relief (concave, convex, none): Concave Slope(%): 2 HGM: N/A
 Subregion (LRR): X Lat: 59.924496 Long: -155.404922 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Closed depression in hillside. Snow accumulation area. Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>95</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Vaccinium uliginosum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACW species <u>7</u> x2= <u>14</u>
4. <u>Loiseleuria procumbens</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	FAC species <u>126</u> x3= <u>378</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>8</u> x4= <u>32</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>113</u>				Column Totals: <u>141</u> (A) <u>424</u> (B)
50% of total cover: <u>56.5</u>				Prevalence Index = B/A= <u>3.01</u>
20% of total cover: <u>22.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>8</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Sanguisorba canadensis</u>	<u>7</u>	<u>Yes</u>	<u>FACW</u>	Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Chamaenerion angustifolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Iris setosa</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>28</u>				
50% of total cover: <u>14</u>				
20% of total cover: <u>5.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic Vegetation Present?
% Cover of Wetland Bryophytes <u> </u>				Yes <u>X</u> No <u> </u>
(Where applicable)				

Remarks:
 Plot limited to Emp nig dominated area. More Vac uli farther upslope, still DEST. Trace: Spi ste.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-3									hor:Oe
3-8	7.5YR 2.5/3	100						Silt Loam	hor:A
8-22	10YR 3/3	100						Silt Loam	hor:B1
22-24	10YR 3/4	100							hor:B2 10YR 3/4

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: WD - Well Drained	Hydric Soil Present? Yes _____ No _____ X _____
---	--

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)					
<input type="checkbox"/> Surface Water (A1)			<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)			<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)			<input type="checkbox"/> Marl Deposits (B15)		<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)			<input type="checkbox"/> Hydrogen Sulfide Odor (C1)		<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)			<input type="checkbox"/> Dry Season Water Table (C2)		<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)			<input type="checkbox"/> Other (Explain in Remarks)		<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)				<input checked="" type="checkbox"/> X	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)					<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)					<input type="checkbox"/> Microtopographic Relief (D4)
				<input checked="" type="checkbox"/> X	<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No _____ X _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ X _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ X _____ Depth (inches): _____ (includes capillary fringe)			Wetland Hydrology Present? Yes _____ X _____ No _____		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary indicators of hydrology observed.

Geomorphic Position: Depression

Additional Reference Data: Photos

HDR2143_18



Photo Name: Photo_180713104421



Photo Name: Photo_180713104426



Photo Name: Photo_180713104430

Additional Reference Data: Photos

HDR2143_18



Photo Name: Photo_180713104400



Photo Name: Photo_180713104351



Photo Name: Photo_180713104412

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/13/2018
 Applicant/Owner: PLP Sampling Point: HDR2147_18
 Investigators: MNW AG Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 2 HGM: N/A
 Subregion (LRR): X Lat: 59.923870 Long: -155.404556 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Willow Tall Shrub (OWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix barclayi</u>	<u>65</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Vaccinium uliginosum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>27</u> x2= <u>54</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>130</u> x3= <u>390</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>1</u> x4= <u>4</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>70</u>				Column Totals: <u>158</u> (A) <u>448</u> (B)
50% of total cover: <u>35</u>				Prevalence Index = B/A= <u>2.84</u>
20% of total cover: <u>14</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Sanguisorba canadensis</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Iris setosa</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Viola epipsila</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Rubus chamaemorus</u>	<u>7</u>	<u>No</u>	<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Trientalis europaea</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>88</u>				
50% of total cover: <u>44</u>				
20% of total cover: <u>17.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>10</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes <u>0</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-8	10YR 3/1	100						Silt Loam	hor:A
8-16	10YR 3/3	100						Silt Loam	hor:B *3

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
Type: _____		
Depth (inches): _____		
Field Drainage Class: WD - Well Drained		

Remarks: 80% cobbles below the A layer *3: Inclusion of fine andy loam that is 7.5YR 3/4 between 4 and 8 inches

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No water table. No saturation.

Geomorphic Position:



Photo Name: Photo_180713112855



Photo Name: Photo_180713112834



Photo Name: Photo_180713112907

Additional Reference Data: Photos

HDR2147_18



Photo Name: Photo_180713112912



Photo Name: Photo_180713112919



Photo Name: Photo_180713112847

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/13/2018
 Applicant/Owner: PLP Sampling Point: HDR2149_18
 Investigators: MW AG Landform (hillslope, terrace, etc.): Shoulder Slope
 Local Relief (concave, convex, none): Concave Slope(%): 2 HGM: N/A
 Subregion (LRR): X Lat: 59.910007 Long: -155.350266 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>		
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Empetrum nigrum</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Salix pulchra</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>3</u> x2= <u>6</u>
3. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	FAC species <u>178</u> x3= <u>534</u>
4. <u>Spiraea beauverdana</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	FACU species <u>10</u> x4= <u>40</u>
5. <u>Rhododendron tomentosum</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
6. <u>Betula nana</u>	<u>7</u>	<u>No</u>	<u>FAC</u>	Column Totals: <u>191</u> (A) <u>580</u> (B)
Total Cover: <u>133</u>				<u>Prevalence Index = B/A=</u> <u>3.04</u>
50% of total cover: <u>66.5</u>				
20% of total cover: <u>26.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Festuca altaica</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>58</u>				
50% of total cover: <u>29</u>				
20% of total cover: <u>11.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>25</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>15</u>				Present?
(Where applicable)				

Remarks: Bare ground is cobbles. Bare areas look like they may collect water but not remain for sufficient duration to be considered ponds. There are no water marks and there is moss and lichen growing on the cobbles.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-14	2.5Y5/3	100					No	Sandy Clay Loam	hor:B1
14-20	2.5Y5/3	90	10YR5/4	10	C	M	No	Sandy Clay Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)		<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)		<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)		<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)		³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)		and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)		⁴ Give details of color change in Remarks.	

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: SPD - Somewhat Poorly Drained	Hydric Soil Present? Yes _____ No _____ X _____
---	--

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes _____ No _____ X _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ X _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ X _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____ X _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No indicators of hydrology. Water visibly seeping in to pit from surface - episaturation from ongoing heavy rain. Hummocks present.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2149_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Salix fuscescens	3	No	FACW

Additional Reference Data: Photos

HDR2149_18



Photo Name: Photo_180713130616



Photo Name: Photo_180713130425

Additional Reference Data: Photos

HDR2149_18



Photo Name: Photo_180713130539



Photo Name: Photo_180713130549



Photo Name: Photo_180713130441



Photo Name: Photo_180713130602

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/13/2018
 Applicant/Owner: PLP Sampling Point: HDR2151_18
 Investigators: MNW AG Landform (hillslope, terrace, etc.): Footslope
 Local Relief (concave, convex, none): None Slope(%): 3 HGM: N/A
 Subregion (LRR): X Lat: 59.909008 Long: -155.346207 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>		
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>		

Remarks: Wetter than normal antecedent precipitation. Plot near stream that has a gravel floodplain. Territorial semi-palmated plovers vocal in area during data collection.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	85	Yes	FAC	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Vaccinium uliginosum</u>	10	No	FAC	OBL species <u> </u> x1= <u> </u>
3. <u>Salix pulchra</u>	5	No	FAC	FACW species <u>22</u> x2= <u>44</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>121</u> x3= <u>363</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u> </u> x4= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u>2</u> x5= <u>10</u>
Total Cover: <u>100</u>				Column Totals: <u>145</u> (A) <u>417</u> (B)
50% of total cover: <u>50</u>				<u>Prevalence Index = B/A=</u> <u>2.88</u>
20% of total cover: <u>20</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Sanguisorba canadensis</u>	20	Yes	FACW	<u>X</u> Dominance Test is >50%
2. <u>Carex microchaeta</u>	15	Yes	FAC	<u>X</u> Prevalence Index is ≤3.0
3. <u>Carex bigelowii</u>	4	No	FAC	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Calamagrostis canadensis</u>	2	No	FAC	<u> </u> data in Remarks or on a separate sheet)
5. <u>Rubus chamaemorus</u>	2	No	FACW	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Luetkea pectinata</u>	2	No	UPL	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>45</u>				
50% of total cover: <u>22.5</u>				
20% of total cover: <u>9</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>20</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>30</u>				Present?
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-6									hor:Oe
6-10								Silt Loam	hor:A/B *3
6-10	10YR 4/2	50						Silt Loam	hor:A/B *4
6-10	10YR3/1	50						Silt Loam	hor:A/B *5
10-12	10YR 4/4							Fine Sandy Loam	hor:C
12-18	10YR 4//4	85	7.5YR 4/4	15	C	PL RC		Silt Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present):	
Type: _____	
Depth (inches): _____	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Field Drainage Class: MWD - Moderately Well Drained	

Remarks: *3: 4" horizon of alternating 0.5 inch bands of 10YR 3/1 SiL and 10YR 4/2 FSaL. *4: 4" horizon of alternating 0.5 inch bands of 10YR 3/1 SiL and 10YR 4/2 FSaL. *5: 4" horizon of alternating 0.5 inch bands of 10YR 3/1 SiL and 10YR 4/2 FSaL.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No saturation or water table present.

Geomorphic Position:



Photo Name: Photo_180713135710



Photo Name: Photo_180713135654



Photo Name: Photo_180713135718

Additional Reference Data: Photos

HDR2151_18



Photo Name: Photo_180713135726



Photo Name: Photo_180713135632



Photo Name: Photo_180713135735

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/13/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2152_18</u>	
Investigators: <u>MW AG</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>12</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.908409</u>	Long: <u>-155.345963</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Open Willow Low Shrub (OWLS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Gully with drainage. Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u>
2. <u>Salix barclayi</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix rotundifolia</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FACW species <u>68</u> x2= <u>136</u>
4. <u>Vaccinium uliginosum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FAC species <u>119</u> x3= <u>357</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>8</u> x4= <u>32</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>66</u>				Column Totals: <u>195</u> (A) <u>525</u> (B)
50% of total cover: <u>33</u>				<u>Prevalence Index = B/A=</u> <u>2.69</u>
20% of total cover: <u>13.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Sanguisorba canadensis</u>	<u>65</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Anemone richardsonii</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Viola epipsila</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Rubus arcticus s.l.</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Chamaenerion angustifolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
7. <u>Athyrium americanum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Achillea millefolium s.l.</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	must be present, unless disturbed or problematic.
9. <u>Carex saxatilis</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>129</u>				
50% of total cover: <u>64.5</u>				
20% of total cover: <u>25.8</u>				
Plot size (radius, or length x width) <u>25 x 50 feet</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u>		% Cover of Bryophytes <u>10</u>		
(Where applicable)				
Remarks: <u>Plot is 25' wide across gully and 50' long. Trace: Pol acu.</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-6	10YR3/2	100					No	Fine Sandy Loam	hor:B1
6-18	10YR3/3	100					No	Silt Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: _____					
Depth (inches): _____					
Field Drainage Class: MWD - Moderately Well Drained					

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	No	X
Surface Water Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): 3.0				
Water Table Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): 2.0				
Saturation Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): 0.0				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Stream through plot. No bed and banks, some flow is over veg. May be runoff from ongoing heavy rain.

Geomorphic Position: Gully



Photo Name: Photo_180713150445



Photo Name: Photo_180713150413



Photo Name: Photo_180713150456

Additional Reference Data: Photos

HDR2152_18



Photo Name: Photo_180713150420



Photo Name: Photo_180713150432



Photo Name: Photo_180713150450

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/13/2018
 Applicant/Owner: PLP Sampling Point: HDR2156_18
 Investigators: MNW AG Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 6 HGM: N/A
 Subregion (LRR): X Lat: 59.909588 Long: -155.340790 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Closed Willow Low Shrub (CWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>67</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>98</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Spiraea stevenii</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>5</u> x2= <u>10</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>117</u> x3= <u>351</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>20</u> x4= <u>80</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>103</u>				Column Totals: <u>142</u> (A) <u>441</u> (B)
50% of total cover: <u>51.5</u>				Prevalence Index = B/A= <u>3.11</u>
20% of total cover: <u>20.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Dryopteris expansa</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Viola epipsila</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
5. <u>Anemone richardsonii</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Polemonium acutiflorum</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>39</u>				
50% of total cover: <u>19.5</u>				
20% of total cover: <u>7.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>4</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>15</u>				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-6									hor:Oe
6-8	10YR 4/2	70	5YR 3/4	30	C		No	Silt Loam	hor:B
8-14	10YR3/2	90	7.5 YR 3/4	10	C		No	Silt Loam	hor:B1
14-16	10YR 4/3	100					No	Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:
☐ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:
☐ Alaska Color Change (TA4)⁴
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox With 2.5Y Hue

☐ Alaska Gleyed Without Hue 5Y or Redder
☐ Underlying Layer
☐ Other (Explain in Remarks)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

Restrictive Layer (if present):
Type: _____
Depth (inches): _____
Field Drainage Class: _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)
☐ Surface Water (A1)
☒ High Water Table (A2)
☒ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Marl Deposits (B15)
☐ Hydrogen Sulfide Odor (C1)
☐ Dry Season Water Table (C2)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)
☐ Water-stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ Microtopographic Relief (D4)
☐ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ☐ No ☒ Depth (inches): _____
Water Table Present? Yes ☒ No ☐ Depth (inches): 12.0
Saturation Present? Yes ☒ No ☐ Depth (inches): 0.0
(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2156_18



Photo Name: Photo_180713155244



Photo Name: Photo_180713155304



Photo Name: Photo_180713155256



Photo Name: Photo_180713155251



Photo Name: Photo_180713155231



Photo Name: Photo_180713155206

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/20/2018
 Applicant/Owner: PLP Sampling Point: HDR2158_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 4 HGM: N/A
 Subregion (LRR): X Lat: 59.898872 Long: -155.356430 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Closed Willow Tall Shrub (CWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>90</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>18</u> x2= <u>36</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>113</u> x3= <u>339</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>8</u> x4= <u>32</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>90</u>				Column Totals: <u>139</u> (A) <u>407</u> (B)
50% of total cover: <u>45</u>				Prevalence Index = B/A= <u>2.93</u>
20% of total cover: <u>18</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Sanguisorba canadensis</u>	<u>12</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Viola langsdorffii</u>	<u>6</u>	<u>No</u>	<u>FACW</u>	Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Anemone richardsonii</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Angelica lucida</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
7. <u>Epilobium angustifolium</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Galium boreale</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	must be present, unless disturbed or problematic.
9. <u>Pyrola asarifolia</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
10. <u>Aconitum delphinifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>49</u>				
50% of total cover: <u>24.5</u>				
20% of total cover: <u>9.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>15</u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u>20</u>				
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-7									hor:Oe
7-12	10YR 4/2	100					No	Silt Loam	hor:A
12-14	7.5YR 4/4	100					No	Silt Loam	hor:B
14-16	10YR 4/2	100					No	Silt Loam	hor:B
16-17	7.5YR 5/6	100					No	Silt Loam	hor:B
17-20	2.5Y 5/2	97					No	Silt Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			
Type: _____			
Depth (inches): _____			
Field Drainage Class: _____			
		Hydric Soil Present?	Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input type="checkbox"/> X <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): 12.0		
Saturation Present? Yes <input type="checkbox"/> X <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): 7.0		
(includes capillary fringe)		Wetland Hydrology Present? Yes <input type="checkbox"/> X <input type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2158_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Cerastium arvense	1	No	FAC

Additional Reference Data: Photos

HDR2158_18



Photo Name: Photo_180720080943



Photo Name: Photo_180720081034

Additional Reference Data: Photos

HDR2158_18



Photo Name: Photo_180720081005



Photo Name: Photo_180720081049



Photo Name: Photo_180720081107



Photo Name: Photo_180720081055

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/20/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2160_18</u>	
Investigators: <u>MNW MD</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>5</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.898689</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u>
2. <u>Alnus sinuata</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium uliginosum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	FACW species <u>38</u> x2= <u>76</u>
4. <u>Betula nana</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FAC species <u>111</u> x3= <u>333</u>
5. <u>Salix reticulata</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FACU species <u>14</u> x4= <u>56</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>47</u>				Column Totals: <u>163</u> (A) <u>465</u> (B)
50% of total cover: <u>23.5</u>				<u>Prevalence Index = B/A=</u> <u>2.85</u>
20% of total cover: <u>9.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Aconitum delphinifolium</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Epilobium angustifolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Carex saxatilis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
7. <u>Petasites frigidus s.l.</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Rubus chamaemorus</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	must be present, unless disturbed or problematic.
9. <u>Rumex arcticus</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
10. <u>Polemonium acutiflorum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>116</u>				
50% of total cover: <u>58</u>				
20% of total cover: <u>23.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>10</u> % Cover of Bryophytes <u>35</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-10									hor:Oe
10-16	10YR 3/2	100					No	Silt Loam	hor:B1 ³
16-20	10YR 3/4	100					No	Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: _____		
Depth (inches): _____		
Field Drainage Class: PD - Poorly Drained		

Remarks: ³: Cobbles starting at 10", 75% cobble

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 10.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2160_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Angelica lucida	3	No	FACU
Pyrola asarifolia	3	No	FACU
Carex saxatilis	3	No	FACW
Viola lanqsdorffii	3	No	FACW
Poa arctica	2	No	FAC
Valeriana capitata	2	No	FAC
Solidago multiradiata	2	No	FACU
Potentilla anserina	2	No	FACW
Luzula parviflora	1	No	FAC
Sedum rosea ssp. integrifolium	1	No	FAC
Luzula multiflora	1	No	FACU

Additional Reference Data: Photos

HDR2160_18



Photo Name: Photo_180720090426



Photo Name: Photo_180720090407



Photo Name: Photo_180720090432



Photo Name: Photo_180720090436



Photo Name: Photo_180720090443

Photo Name: Photo_180720090332



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/20/2018
 Applicant/Owner: PLP Sampling Point: HDR2163_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 8 HGM: N/A
 Subregion (LRR): X Lat: 59.898785 Long: -155.356049 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Closed Willow Low Shrub (CWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>60</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>5</u> x2= <u>10</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>110</u> x3= <u>330</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>15</u> x4= <u>60</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>80</u>				Column Totals: <u>130</u> (A) <u>400</u> (B)
50% of total cover: <u>40</u>				Prevalence Index = B/A= <u>3.08</u>
20% of total cover: <u>16</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Angelica lucida</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Epilobium angustifolium</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Petasites frigidus s.l.</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
5. <u>Anemone richardsonii</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Equisetum arvense</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
7. <u>Lycopodium annotinum s.l.</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Pyrola asarifolia</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	must be present, unless disturbed or problematic.
9. <u>Rubus arcticus s.l.</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u>Trientalis europaea</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>50</u>				
50% of total cover: <u>25</u>				
20% of total cover: <u>10</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>4</u>				Vegetation
% Cover of Wetland Bryophytes <u>25</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>0</u>				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-6									hor:Oe
6-14	7.5YR 2.5/2	100							hor:B1
14-20	10YR 4/4	100					No	Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	
Type: _____		Yes	No
Depth (inches): _____			X
Field Drainage Class: MWD - Moderately Well Drained			

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Yes	No
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> X		
Saturation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> X		
(includes capillary fringe)			

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2163_18



Photo Name: Photo_180720100540



Photo Name: Photo_180720100545



Photo Name: Photo_180720100534

Additional Reference Data: Photos

HDR2163_18



Photo Name: Photo_180720100437



Photo Name: Photo_180720100529



Photo Name: Photo_180720100511

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/20/2018
 Applicant/Owner: PLP Sampling Point: HDR2165_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): _____ HGM: N/A
 Subregion (LRR): X Lat: 59.896687 Long: -155.356598 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)
 Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>8</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>9</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>89</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Vaccinium uliginosum</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>11</u> x1= _____
3. <u>Alnus sinuata</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>123</u> x2= <u>22</u>
4. <u>Ledum decumbens</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	FAC species <u>21</u> x3= <u>369</u>
5. <u>Spiraea stevenii</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	FACU species <u>2</u> x4= <u>84</u>
6. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	UPL species <u>157</u> x5= <u>10</u>
Total Cover: <u>79</u>				Column Totals: <u>157</u> (A) <u>485</u> (B)
50% of total cover: <u>39.5</u>				Prevalence Index = B/A= <u>3.09</u>
20% of total cover: <u>15.8</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Carex microchaeta</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Valeriana capitata</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Arnica chamissonis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
7. <u>Rubus chamaemorus</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
8. <u>Polygonum bistorta ssp. plumosum</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
9. <u>Solidago multiradiata</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	must be present, unless disturbed or problematic.
10. <u>Athyrium cyclosum</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>78</u>				
50% of total cover: <u>39</u>				
20% of total cover: <u>15.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No _____
% Cover of Bryophytes ⁵ _____				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-6									hor:Oe
6-17	7.5YR 2.5/2	100					No	Sandy Loam	hor:B1
17-20	10YR3/4	100						Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: _____					
Depth (inches): _____					
Field Drainage Class: MWD - Moderately Well Drained					

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	X	No
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches): _____				
Water Table Present? Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches): 20.0				
Saturation Present? Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches): 8.0				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hummocks present.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2165_18

	Absolute % Cover	Dominant Species?	Indicator Status
Herb			
Festuca altaica	2	No	FAC
Sedum rosea ssp. integrifolium	2	No	FAC
Angelica lucida	2	No	FACU
Aconitum delphiniifolium	1	No	FAC
Claytonia sarmentosa	1	No	FAC
Cornus suecica	1	No	FAC
Poa arctica	1	No	FAC
Luzula multiflora	1	No	FACU
Pedicularis capitata	1	No	FACU
Viola langsdorffii	1	No	FACW
Artemisia arctica	1	No	NL
Lagotis glauca s.l.	1	No	NL
Sapling/Shrub			
Betula nana	3	No	FAC
Salix reticulata	3	No	FAC
Vaccinium vitis-idaea	2	No	FAC
Picea glauca	1	No	FACU

Additional Reference Data: Photos

HDR2165_18



Photo Name: Photo_180720105046

Additional Reference Data: Photos

HDR2165_18



Photo Name: Photo_180720105121



Photo Name: Photo_180720105132



Photo Name: Photo_180720105055

Additional Reference Data: Photos

HDR2165_18



Photo Name: Photo_180720105116



Photo Name: Photo_180720105126

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/20/2018
 Applicant/Owner: PLP Sampling Point: HDR2166_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 1 HGM: Slope
 Subregion (LRR): X Lat: 59.896866 Long: -155.356125 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1/EM1B

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Carex (DEST-C)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			

Remarks: Slight terrace in slope. Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u>18</u> <u>Multiply by:</u>
2. <u>Betula nana</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>18</u> x1= <u>18</u>
3. <u>Empetrum nigrum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACW species <u>17</u> x2= <u>34</u>
4. <u>Salix fuscescens</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	FAC species <u>146</u> x3= <u>438</u>
5. <u>Salix reticulata</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>1</u> x4= <u>4</u>
6. <u>Vaccinium uliginosum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>80</u>				Column Totals: <u>182</u> (A) <u>494</u> (B)
50% of total cover: <u>40</u>				<u>Prevalence Index = B/A=</u> <u>2.71</u>
20% of total cover: <u>16</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	<u>55</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex aquatilis</u>	<u>18</u>	<u>No</u>	<u>OBL</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Carex microchaeta</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Poa arctica</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sedum rosea ssp. integrifolium</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
7. <u>Petasites frigidus s.l.</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Rubus chamaemorus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	must be present, unless disturbed or problematic.
9. <u>Rumex arcticus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
10. <u>Aconitum delphinifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>102</u>				
50% of total cover: <u>51</u>				
20% of total cover: <u>20.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>15</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>40</u>				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-20									hor:Oe

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):			Hydric Soil Present?		
Type:			Yes	<input checked="" type="checkbox"/> X	No
Depth (inches):					
Field Drainage Class:	PD - Poorly Drained				

Remarks: Gravel inclusion at 10"

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)			<input type="checkbox"/> Water-stained Leaves (B9)		
<input type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Microtopographic Relief (D4)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input checked="" type="checkbox"/> X FAC-Neutral Test (D5)		

Field Observations:			Wetland Hydrology Present?		
Surface Water Present?	Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):		
Water Table Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	0.0	
Saturation Present?	Yes	<input checked="" type="checkbox"/> X No	Depth (inches):	0.0	
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2166_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Polemonium acutiflorum	1	No	FAC
Pyrola asarifolia	1	No	FACU
Pedicularis lanqsdorfii	1	No	FACW

Additional Reference Data: Photos

HDR2166_18



Photo Name: Photo_180720114556



Photo Name: Photo_180720114605



Photo Name: Photo_180720114537



Photo Name: Photo_180720114528



Photo Name: Photo_180720114612



Photo Name: Photo_180720114550

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/20/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2167_18</u>	
Investigators: <u>MW MD</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>4</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.896626</u>	Long: <u>-155.356003</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Vaccinium uliginosum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Empetrum nigrum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix pulchra</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACW species <u>5</u> x2= <u>10</u>
4. <u>Betula nana</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FAC species <u>117</u> x3= <u>351</u>
5. <u>Ledum decumbens</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>3</u> x4= <u>12</u>
6. <u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>88</u>				Column Totals: <u>125</u> (A) <u>373</u> (B)
50% of total cover: <u>44</u>				<u>Prevalence Index = B/A=</u> <u>2.98</u>
20% of total cover: <u>17.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Carex microchaeta</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Rubus chamaemorus</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Calamagrostis canadensis</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Cornus suecica</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Angelica lucida</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
8. <u>Epilobium angustifolium</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
9. <u>Pedicularis labradorica</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
10. <u>Petasites frigidus s.l.</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>37</u>				Hydrophytic Vegetation Yes <u>X</u> No <u> </u>
50% of total cover: <u>18.5</u>				
20% of total cover: <u>7.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>15</u> % Cover of Bryophytes <u>20</u>				
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-4									hor:Oe
4-8	7.5 YR 3/3	100					No	Sandy Loam	hor:B1
8-22	10YR4/4	100						Sandy Clay Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		
Type: _____		
Depth (inches): _____		
Field Drainage Class: _____		
	Hydric Soil Present?	Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input type="checkbox"/> X <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): 4.0		
Saturation Present? Yes <input type="checkbox"/> X <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0		
(includes capillary fringe)		
	Wetland Hydrology Present?	Yes <input type="checkbox"/> X <input type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

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	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Alnus sinuata</u>	<u>3</u>	<u>No</u>	<u>FAC</u>

Additional Reference Data: Photos

HDR2167_18



Photo Name: Photo_180720124519



Photo Name: Photo_180720124500



Photo Name: Photo_180720124533



Photo Name: Photo_180720124528



Photo Name: Photo_180720124510

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/20/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2169_18</u>	
Investigators: <u>MNW MD</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>Convex</u>	Slope(%): <u>6</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.896343</u>	Long: <u>-155.354858</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra (DEST)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Ledum decumbens</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Empetrum nigrum</u>	<u>22</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Spiraea beauverdiana</u>	<u>8</u>	<u>No</u>	<u>FACU</u>	FACW species <u>8</u> x2= <u>16</u>
4. <u>Salix pulchra</u>	<u>6</u>	<u>No</u>	<u>FAC</u>	FAC species <u>141</u> x3= <u>423</u>
5. <u>Arctostaphylos alpina</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>13</u> x4= <u>52</u>
6. <u>Betula nana</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	UPL species <u>1</u> x5= <u>5</u>
Total Cover: <u>93</u>				Column Totals: <u>163</u> (A) <u>496</u> (B)
50% of total cover: <u>46.5</u>				<u>Prevalence Index = B/A=</u> <u>3.04</u>
20% of total cover: <u>18.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>45</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	<u>11</u>	<u>No</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Rubus chamaemorus</u>	<u>8</u>	<u>No</u>	<u>FACW</u>	Morphological Adaptations ¹ (Provide
4. <u>Angelica lucida</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u>Dryopteris expansa</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Trientalis europaea</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
7. <u>Hierochloe alpina</u>	<u>1</u>	<u>No</u>	<u>NL</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>70</u>				
50% of total cover: <u>35</u>				
20% of total cover: <u>14</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>3</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>15</u>				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-5									hor:Oe
5-13	10YR 3/3	100							hor:B1
13-20	7.5YR 3/3	100						Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: _____	
Depth (inches): _____	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Field Drainage Class: MWD - Moderately Well Drained	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
(includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
no water observed in pit. No saturation

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2169_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Vaccinium uliginosum	4	No	FAC
Vaccinium vitis-idaea	4	No	FAC

Additional Reference Data: Photos

HDR2169_18



Photo Name: Photo_180720132352



Photo Name: Photo_180720132452



Photo Name: Photo_180720132442



Photo Name: Photo_180720132424



Photo Name: Photo_180720132458



Photo Name: Photo_180720132509

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/20/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2171_18</u>	
Investigators: <u>MNW MD</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>Convex</u>	Slope(%): <u>3</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.896690</u>	Long: <u>-155.350571</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation. Plot in Valley bottom near a small stream. Hummocks with a lot of lichen cover.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	60	Yes	FAC	Total % Cover of: <u> </u> Multiply by:
2. <u>Vaccinium uliginosum</u>	25	Yes	FAC	OBL species <u> </u> x1= <u> </u>
3. <u>Arctostaphylos alpina</u>	10	No	FAC	FACW species <u> </u> x2= <u> </u>
4. <u>Spiraea beauverdia</u>	4	No	FACU	FAC species <u>121</u> x3= <u>363</u>
5. <u>Betula nana</u>	2	No	FAC	FACU species <u>4</u> x4= <u>16</u>
6. <u>Ledum decumbens</u>	2	No	FAC	UPL species <u>1</u> x5= <u>5</u>
Total Cover: <u>105</u>				Column Totals: <u>126</u> (A) <u>384</u> (B)
50% of total cover: <u>52.5</u>				Prevalence Index = B/A= <u>3.05</u>
20% of total cover: <u>21</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex microchaeta</u>	15	Yes	FAC	X Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	2	No	FAC	Prevalence Index is ≤3.0
3. <u>Luzula parviflora</u>	2	No	FAC	Morphological Adaptations ¹ (Provide
4. <u>Poa arctica</u>	1	No	FAC	data in Remarks or on a separate sheet)
5. <u>Hierochloe alpina</u>	1	No	NL	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>21</u>				
50% of total cover: <u>10.5</u>				
20% of total cover: <u>4.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>3</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes <u>0</u>				
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-1									hor:Oi
1-3									hor:Oe
3-9	10YR 3/3	100					No	Sandy Loam	hor:B1
9-20	10YR 3/4	100					No	Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: _____					
Depth (inches): _____					
Field Drainage Class: MWD - Moderately Well Drained					

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)		
Primary Indicators (minimum of one required; check all that apply)					
<input type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)		
<input type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)		
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)		
<input type="checkbox"/> Sediment Deposits (B2)		<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)		
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)		
<input type="checkbox"/> Algal Mat or Crust (B4)			<input type="checkbox"/> Geomorphic Position (D2)		
<input type="checkbox"/> Iron Deposits (B5)			<input type="checkbox"/> Shallow Aquitard (D3)		
<input type="checkbox"/> Surface Soil Cracks (B6)			<input type="checkbox"/> Microtopographic Relief (D4)		
			<input type="checkbox"/> FAC-Neutral Test (D5)		
Field Observations:					
Surface Water Present?	Yes	No	X	Depth (inches):	
Water Table Present?	Yes	No	X	Depth (inches):	
Saturation Present?	Yes	X	No	Depth (inches):	8.0
(includes capillary fringe)					
			Wetland Hydrology Present?	Yes	X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hummocks present.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2171_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Salix pulchra	2	No	FAC

Additional Reference Data: Photos

HDR2171_18



Photo Name: Photo_180720143109



Photo Name: Photo_180720143145

Additional Reference Data: Photos

HDR2171_18



Photo Name: Photo_180720143139



Photo Name: Photo_180720143130



Photo Name: Photo_180720143154

Additional Reference Data: Photos

HDR2171_18

Photo Name: Photo_180720143215



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/20/2018
 Applicant/Owner: PLP Sampling Point: HDR2172_18
 Investigators: MW MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 2 HGM: N/A
 Subregion (LRR): X Lat: 59.896435 Long: -155.350128 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>			

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	40	Yes	FAC	Total % Cover of: <u> </u> Multiply by:
2. <u>Vaccinium uliginosum</u>	20	Yes	FAC	OBL species <u> </u> x1= <u> </u>
3. <u>Betula nana</u>	10	No	FAC	FACW species <u> </u> x2= <u> </u>
4. <u>Ledum decumbens</u>	5	No	FAC	FAC species <u>111</u> x3= <u>333</u>
5. <u>Salix pulchra</u>	5	No	FAC	FACU species <u>5</u> x4= <u>20</u>
6. <u>Spiraea beauverdiana</u>	5	No	FACU	UPL species <u>8</u> x5= <u>40</u>
Total Cover: <u>92</u>				Column Totals: <u>124</u> (A) <u>393</u> (B)
50% of total cover: <u>46</u>				Prevalence Index = B/A= <u>3.17</u>
20% of total cover: <u>18.4</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	10	Yes	FAC	<u>X</u> Dominance Test is >50%
2. <u>Carex bigelowii</u>	10	Yes	FAC	Prevalence Index is ≤3.0
3. <u>Artemisia arctica</u>	5	No	NL	Morphological Adaptations ¹ (Provide
4. <u>Hierochloe odorata</u>	3	No	NL	data in Remarks or on a separate sheet)
5. <u>Valeriana capitata</u>	2	No	FAC	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Aconitum delphiniifolium</u>	1	No	FAC	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u>Poa arctica</u>	1	No	FAC	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>32</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>16</u>				
20% of total cover: <u>6.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes <u>30</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-3									hor:Oe
3-11	10YR 2/2	100					N/A	Silt Loam	hor:A
11-20	10YR 3/3	100					N/A	Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: WD - Well Drained	Hydric Soil Present? Yes _____ No _____ X _____
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes _____ No _____ X _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ X _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ X _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____ X _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydrology indicators observed. Hummocks present.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2172_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Vaccinium vitis-idaea	3	No	FAC
Arctostaphylos alpina	2	No	FAC
Salix arctica	2	No	FAC

Additional Reference Data: Photos

HDR2172_18



Photo Name: Photo_180720151404



Photo Name: Photo_180720151316

Additional Reference Data: Photos

HDR2172_18



Photo Name: Photo_180720151332



Photo Name: Photo_180720151412



Photo Name: Photo_180720151423



Photo Name: Photo_180720151357

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/20/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2173_18</u>	
Investigators: <u>MNW MD</u>	Landform (hillslope, terrace, etc.): <u>Terrace</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>2</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.896431</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1C</u>	

Vegetation Type: Closed Willow Tall Shrub (CWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>73</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Spiraea stevenii</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>25</u> x2= <u>50</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>120</u> x3= <u>360</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>17</u> x4= <u>68</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>83</u>				Column Totals: <u>162</u> (A) <u>478</u> (B)
50% of total cover: <u>41.5</u>				<u>Prevalence Index = B/A=</u> <u>2.95</u>
20% of total cover: <u>16.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>38</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Sanguisorba canadensis</u>	<u>21</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Viola langsdorffii</u>	<u>4</u>	<u>No</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Aconitum delphinifolium</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Pyrola minor</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Rubus arcticus s.l.</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
7. <u>Sedum rosea ssp. integrifolium</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Achillea millefolium s.l.</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	must be present, unless disturbed or problematic.
9. <u>Angelica lucida</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
10. <u>Geranium erianthum</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>81</u>				
50% of total cover: <u>40.5</u>				
20% of total cover: <u>16.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>5</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>10</u>				Present?
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-5									hor:Oi
5-10									hor:Oe
10-16									hor:Oa
16-19	10YR 3/2	100						Silt Loam	

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: PD - Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
---	---

Remarks: Faint H2S at 10"

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 4.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2173_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Carex sp.	2	No	N/A
Valeriana capitata	1	No	FAC
Trientalis europaea	1	No	FACU

Additional Reference Data: Photos

HDR2173_18



Photo Name: Photo_180720154621



Photo Name: Photo_180720154524

Additional Reference Data: Photos

HDR2173_18



Photo Name: Photo_180720154457



Photo Name: Photo_180720154549



Photo Name: Photo_180720154600



Photo Name: Photo_180720154537

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/21/2018
 Applicant/Owner: PLP Sampling Point: HDR2175_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Convex Slope(%): 5 HGM: Slope
 Subregion (LRR): X Lat: 59.889084 Long: -155.327805 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1B

Vegetation Type: Closed Willow Tall Shrub (CWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation. Plot on slope near stream

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>75</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Ribes laxiflorum</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u> </u> x2= <u> </u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>160</u> x3= <u>480</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>57</u> x4= <u>228</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>77</u>				Column Totals: <u>217</u> (A) <u>708</u> (B)
50% of total cover: <u>38.5</u>				Prevalence Index = B/A= <u>3.26</u>
20% of total cover: <u>15.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>55</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Dryopteris expansa</u>	<u>35</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Epilobium angustifolium</u>	<u>20</u>	<u>No</u>	<u>FACU</u>	data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>140</u>				
50% of total cover: <u>70</u>				
20% of total cover: <u>28</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>15</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>15</u>				Present?
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α - α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-6									hor:Oe
6-12									hor:Oa
12-15									hor:Oe Oeb
15-20									hor:Oa

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: PD - Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
---	---

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No water in pit but saturated to the surface. Presume water table is below bottom of pit.

Geomorphic Position:

Additional Reference Data: Photos

HDR2175_18



Photo Name: Photo_180721080047



Photo Name: Photo_180721080026



Photo Name: Photo_180721080008

Additional Reference Data: Photos

HDR2175_18



Photo Name: Photo_180721080055



Photo Name: Photo_180721080042



Photo Name: Photo_180721080059

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	7/21/2018
Applicant/Owner:	PLP			Sampling Point:	HDR2176_18
Investigators:	MW MD	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	Concave	Slope(%):	3	HGM:	Slope
Subregion (LRR):	X	Lat:	59.889050	Long:	-155.327667
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	PSS1B		

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)

Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ X _____ No _____

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> X </u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			

				Dominance Test Worksheet:			
Tree Stratum		Absolute % Cover	Dominant Species?	Indicator Status	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)		
1.					Total Number of Dominant Species Across All Strata: <u>3</u> (B)		
2.					Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)		
3.							
4.							
Total Cover:							
50% of total cover:		<u>0</u>	20% of total cover:	<u>0</u>			
Sapling/Shrub Stratum				Prevalence Index worksheet:			
1.	Salix pulchra	80	Yes	FAC	Total % Cover of:		Multiply by:
2.					OBL species	x1=	
3.					FACW species	<u>13</u> x2=	<u>26</u>
4.					FAC species	<u>124</u> x3=	<u>372</u>
5.					FACU species	x4=	
6.					UPL species	x5=	
Total Cover:		<u>80</u>			Column Totals:	<u>137</u> (A)	<u>398</u> (B)
50% of total cover:		<u>40</u>	20% of total cover:	<u>16</u>	Prevalence Index = B/A= <u>2.91</u>		
Herb Stratum				Hydrophytic Vegetation Indicators:			
1.	Equisetum arvense	20	Yes	FAC	X	Dominance Test is >50%	
2.	Calamagrostis canadensis	15	Yes	FAC	X	Prevalence Index is ≤3.0	
3.	Sanguisorba canadensis	5	No	FACW	Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet)		
4.	Viola langsdorffii	5	No	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)		
5.	Anemone richardsonii	3	No	FAC			
6.	Epilobium latifolium	3	No	FAC			
7.	Rubus arcticus s.l.	3	No	FAC			
8.	Rumex arcticus	3	No	FACW			
9.							
10.							
Total Cover:		<u>57</u>					
50% of total cover:		<u>28.5</u>	20% of total cover:	<u>11.4</u>			
Plot size (radius, or length x width)		<u>1/10 acre</u>	% Bare Ground	<u>10</u>			
% Cover of Wetland Bryophytes		<u>25</u>	% Cover of Bryophytes	<u>25</u>			
(Where applicable)							
				Hydrophytic Vegetation Present? Yes <u>X</u> No <u></u>			

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-10									hor:Oe
10-14	10YR 3/3	40					Yes	Sandy Loam	hor:B
10-14	10YR4/1	60					Yes	Sandy Loam	hor:B
14-20									hor:Oe Oeb

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydic Soil Indicators:			Indicators for Problematic Hydic Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: PD - Poorly Drained	Hydic Soil Present? Yes <input checked="" type="checkbox"/> No _____
---	--

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 4.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:



Photo Name: Photo_180721082339



Photo Name: Photo_180721082312



Photo Name: Photo_180721082221

Additional Reference Data: Photos

HDR2176_18



Photo Name: Photo_180721082319



Photo Name: Photo_180721082328



Photo Name: Photo_180721082245

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	7/21/2018
Applicant/Owner:	PLP			Sampling Point:	HDR2178_18
Investigators:	MNW MD	Landform (hillslope, terrace, etc.):	Toeslope		
Local Relief (concave, convex, none):	None	Slope(%):	3	HGM:	Slope
Subregion (LRR):	X	Lat:	59.888809	Long:	-155.326889
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	PSS1B		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

				Dominance Test Worksheet:			
<u>Tree Stratum</u>		Absolute % Cover	Dominant Species?	Indicator Status	Number of Dominant Species		
1.					That Are OBL, FACW, or FAC: 2 (A)		
2.					Total Number of Dominant		
3.					Species Across All Strata: 3 (B)		
4.					Percent of Dominant Species		
Total Cover:					That Are OBL, FACW, or FAC: 67 (A/B)		
50% of total cover:		0	20% of total cover:		0		
<u>Sapling/Shrub Stratum</u>					Prevalence Index worksheet:		
1.	Salix pulchra	65	Yes	FAC	Total % Cover of: Multiply by:		
2.					OBL species x1=		
3.					FACW species x2=		
4.					FAC species 155 x3= 465		
5.					FACU species 50 x4= 200		
6.					UPL species x5=		
Total Cover:		65			Column Totals: 205 (A) 665 (B)		
50% of total cover:		32.5	20% of total cover:		13	Prevalence Index = B/A= 3.24	
<u>Herb Stratum</u>					Hydrophytic Vegetation Indicators:		
1.	Calamagrostis canadensis	65	Yes	FAC	X	Dominance Test is >50%	
2.	Epilobium angustifolium	35	Yes	FACU		Prevalence Index is ≤3.0	
3.	Equisetum arvense	25	No	FAC		Morphological Adaptations ¹ (Provide	
4.	Dryopteris expansa	15	No	FACU		data in Remarks or on a separate sheet)	
5.						Problematic Hydrophytic Vegetation ¹ (Explain)	
6.							
7.							
8.							
9.							
10.							
Total Cover:		140					
50% of total cover:		70	20% of total cover:		28		
Plot size (radius, or length x width) 1/10 acre			% Bare Ground		20		
% Cover of Wetland Bryophytes 0			% Cover of Bryophytes 60				
(Where applicable)							
					Hydrophytic Vegetation Present?		
					Yes X No		

Remarks:
Some dead willow stems contributing to the open nature of the plot

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-8									hor:Oi
8-14									hor:Oe
14-18	10YR 4/4	60					No	Sandy Loam	Gravel at 14"
14-18	7.5YR 4/4	40					No	Sandy Loam	Gravel at 14"

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: PD - Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): 0.5 Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): 0.0 Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): 0.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2178_18



Photo Name: Photo_180721090322



Photo Name: Photo_180721090315



Photo Name: Photo_180721090247

Additional Reference Data: Photos

HDR2178_18



Photo Name: Photo_180721090308



Photo Name: Photo_180721090329

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/21/2018
 Applicant/Owner: PLP Sampling Point: HDR2180_18
 Investigators: MW ME Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 8 HGM: Slope
 Subregion (LRR): X Lat: 59.890167 Long: -155.329666 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1B

Vegetation Type: Closed Willow Low Shrub (CWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>30</u> x2= <u>60</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>120</u> x3= <u>360</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>3</u> x4= <u>12</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>153</u> (A) <u>432</u> (B)
Total Cover: <u>80</u>				<u>Prevalence Index = B/A=</u> <u>2.82</u>
50% of total cover: <u>40</u>				
20% of total cover: <u>16</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Sanguisorba canadensis</u>	<u>25</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Anemone richardsonii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Polemonium acutiflorum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Viola langsdorffii</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
7. <u>Angelica lucida</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>73</u>				
50% of total cover: <u>36.5</u>				
20% of total cover: <u>14.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>4</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>30</u>				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-6									hor:Oi
6-11									hor:Oe
11-17	10YR 2/2	100					Yes	Silt Loam	hor:B1 Cobbles at 11"
17-22	10YR 2/2	95	7.5 YR 3/4	5	C	PL	Yes	Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: PD - Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks: Hydrogen sulfide odor at 4".

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 16.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 4.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2180_18



Photo Name: Photo_180721093846



Photo Name: Photo_180721093823



Photo Name: Photo_180721093914



Photo Name: Photo_180721093909



Photo Name: Photo_180721093919



Photo Name: Photo_180721093836



Photo Name: Photo_180721093927

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/21/2018
 Applicant/Owner: PLP Sampling Point: HDR2181_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 2 HGM: N/A
 Subregion (LRR): X Lat: 59.890545 Long: -155.332520 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>			
Remarks: <u>Wetter than normal antecedent precipitation.</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>2</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>90</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Vaccinium uliginosum</u>	<u>22</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix arctica</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
4. <u>Ledum decumbens</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	FAC species <u>145</u> x3= <u>435</u>
5. <u>Spiraea beauverdiana</u>	<u>8</u>	<u>No</u>	<u>FACU</u>	FACU species <u>9</u> x4= <u>36</u>
6. <u>Betula nana</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	UPL species <u>2</u> x5= <u>10</u>
Total Cover: <u>142</u>				Column Totals: <u>156</u> (A) <u>481</u> (B)
50% of total cover: <u>71</u>				Prevalence Index = B/A= <u>3.08</u>
20% of total cover: <u>28.4</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>8</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Cornus suecica</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Luetkea pectinata</u>	<u>2</u>	<u>No</u>	<u>UPL</u>	Morphological Adaptations ¹ (Provide
4. <u>Sedum rosea ssp. integrifolium</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Trientalis europaea</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>14</u>				
50% of total cover: <u>7</u>				
20% of total cover: <u>2.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>5</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes ⁵ <u> </u>				Present?
(Where applicable)				

Remarks: Nearby hollows between hummocks do not show a waterline or OHWM and do not contain water

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-9	7.5 YR 3/2	100						Silt Loam	hor:A
9-20	10 YR 3/3	100						Sandy Loam	hor:B Gravel at 11"

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
Type: _____		
Depth (inches): _____		
Field Drainage Class: MWD - Moderately Well Drained		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____		
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary hydro indicators present. Hummocks present.

Geomorphic Position:

Additional Reference Data: Photos

HDR2181_18



Photo Name: Photo_180721101538



Photo Name: Photo_180721101549



Photo Name: Photo_180721101554

Additional Reference Data: Photos

HDR2181_18



Photo Name: Photo_180721101544



Photo Name: Photo_180721101500



Photo Name: Photo_180721101514

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/21/2018</u>
Applicant/Owner: <u>PLP</u>		Sampling Point: <u>HDR2182_18</u>
Investigators: <u>MW MD</u>	Landform (hillslope, terrace, etc.): <u>Terrace</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>1</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.890358</u>	Long: <u>-155.332703</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1/EM1B</u>	Datum: <u>WGS84</u>

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Equisetum (DEST-EQ)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks: Wetter than normal antecedent precipitation.		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: _____				
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		

<u>Sapling/Shrub Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Empetrum nigrum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Betula nana</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
4. <u>Salix fuscescens</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>	
5. <u>Salix pulchra</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
6. <u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>110</u>				
50% of total cover: <u>55</u>		20% of total cover: <u>22</u>		

<u>Herb Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Equisetum arvense</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Carex bigelowii</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
4. <u>Rubus chamaemorus</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
5. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
6. <u>Luetkea pectinata</u>	<u>5</u>	<u>No</u>	<u>UPL</u>	
7. <u>Sedum rosea ssp. integrifolium</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
8. <u>Carex canescens</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>66</u>				
50% of total cover: <u>33</u>		20% of total cover: <u>13.2</u>		
Plot size (radius, or length x width) <u>1/10 acre</u>		% Bare Ground <u>3</u>		
% Cover of Wetland Bryophytes <u>10</u>	% Cover of Bryophytes <u>10</u>			
(Where applicable)				

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

<u>Total % Cover of:</u>	<u>Multiply by:</u>
OBL species	x1= _____
FACW species <u>33</u>	x2= <u>66</u>
FAC species <u>133</u>	x3= <u>399</u>
FACU species <u>5</u>	x4= <u>20</u>
UPL species <u>5</u>	x5= <u>25</u>
Column Totals: <u>176</u> (A)	<u>510</u> (B)

Prevalence Index = B/A= 2.90

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0

Morphological Adaptations¹ (Provide data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-6									hor:Oi
6-8									hor:Oe
8-18	7.5 YR 2.5/2	100					No	Silt Loam	hor:B *3

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks: *3: Cobbles start at 8" and make up 65% of B layer. Many roots in B layer

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:									
Surface Water Present?	Yes		No	X	Depth (inches):				
Water Table Present?	Yes	X	No		Depth (inches):	12.0			
Saturation Present?	Yes	X	No		Depth (inches):	7.0			
(includes capillary fringe)					Wetland Hydrology Present? Yes X No				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hummocks present.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2182_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Spiraea beauverdiana</u>	<u>5</u>	<u>No</u>	<u>FACU</u>

Additional Reference Data: Photos

HDR2182_18



Photo Name: Photo_180721110442



Photo Name: Photo_180721110357

Additional Reference Data: Photos

HDR2182_18



Photo Name: Photo_180721110417



Photo Name: Photo_180721110447



Photo Name: Photo_180721110453



Photo Name: Photo_180721110500

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	7/21/2018
Applicant/Owner:	PLP			Sampling Point:	HDR2184_18
Investigators:	MNW MD	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	Concave	Slope(%):	0	HGM:	Slope
Subregion (LRR):	X	Lat:	59.890991	Long:	-155.332092
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	PEM1B		

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> X </u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			

Tree Stratum		Absolute % Cover	Dominant Species?	Indicator Status
1.				
2.				
3.				
4.				
Total Cover:				
50% of total cover:		0	20% of total cover:	0
Sapling/Shrub Stratum				
1.	Salix fuscescens	15	Yes	FACW
2.				
3.				
4.				
5.				
6.				
Total Cover:		15		
50% of total cover:		7.5	20% of total cover:	3
Herb Stratum				
1.	Eriophorum angustifolium	40	Yes	OBL
2.	Carex pluriflora	35	Yes	OBL
3.	Equisetum arvense	7	No	FAC
4.	Carex aquatilis	4	No	OBL
5.	Comarum palustre	4	No	OBL
6.	Eriophorum scheuchzeri	4	No	OBL
7.	Calamagrostis canadensis	2	No	FAC
8.	Rumex arcticus	2	No	FACW
9.				
10.				
Total Cover:		98		
50% of total cover:		49	20% of total cover:	19.6
Plot size (radius, or length x width) 1/10 acre			% Bare Ground	0
% Cover of Wetland Bryophytes 80			% Cover of Bryophytes 85	
(Where applicable)				

Dominance Test Worksheet:

Number of Dominant Species

That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 87	x1= 87
FACW species 17	x2= 34
FAC species 9	x3= 27
FACU species	x4=
UPL species	x5=
Column Totals: 113 (A)	148 (B)

Prevalence Index = B/A= 1.31

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0

Morphological Adaptations¹ (Provide data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present?

Yes X No

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-11									hor:Oe
11-19	10YR 3/2	100					Yes	Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	PD - Poorly Drained				

Remarks: Cobbles below 11" to 19"

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input checked="" type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:									
Surface Water Present?	Yes	<u> </u>	No	<u> X </u>	Depth (inches):	<u> </u>			
Water Table Present?	Yes	<u> X </u>	No	<u> </u>	Depth (inches):	<u> 0.0 </u>			
Saturation Present?	Yes	<u> X </u>	No	<u> </u>	Depth (inches):	<u> 0.0 </u>			
(includes capillary fringe)									
					Wetland Hydrology Present? Yes <u> X </u> No <u> </u>				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2184_18



Photo Name: Photo_180721120836



Photo Name: Photo_180721120733



Photo Name: Photo_180721120824



Photo Name: Photo_180721120759



Photo Name: Photo_180721120830



Photo Name: Photo_180721120842

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/21/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2185_18</u>	
Investigators: <u>MW MD</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>6</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.891945</u>	Long: <u>-155.330093</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
		NWI Classification: <u>PSS1/EM1B</u>

Vegetation Type: Subarctic Sedge – Moss Wet Meadow (SSMWM)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: Wetter than normal antecedent precipitation.		

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		Prevalence Index worksheet: <u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u> OBL species <u>15</u> x1= <u>15</u> FACW species <u>17</u> x2= <u>34</u> FAC species <u>63</u> x3= <u>189</u> FACU species <u> </u> x4= <u> </u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>95</u> (A) <u>238</u> (B) <i>Prevalence Index = B/A=</i> <u>2.51</u>
Sapling/Shrub Stratum				
1. <u>Salix pulchra</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>40</u>				
50% of total cover: <u>20</u>		20% of total cover: <u>8</u>		
Herb Stratum				Hydrophytic Vegetation Indicators: X Dominance Test is >50% X Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
1. <u>Equisetum arvense</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Potentilla anserina</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	
3. <u>Carex pauciflora</u>	<u>10</u>	<u>Yes</u>	<u>OBL</u>	
4. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
5. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
6. <u>Carex aquatilis</u>	<u>5</u>	<u>No</u>	<u>OBL</u>	
7. <u>Rubus arcticus s.l.</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
8. <u>Viola langsdoeffii</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>55</u>				
50% of total cover: <u>27.5</u>		20% of total cover: <u>11</u>		
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>90</u> % Cover of Bryophytes <u>90</u> (Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-20									hor:Oa

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input checked="" type="checkbox"/> Histosol or Histel (A1)		<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)		<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)		<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)		³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)		and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)		⁴ Give details of color change in Remarks.	

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/>	No	
Type:						
Depth (inches):						
Field Drainage Class:	VPD - Very Poorly Drained					

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/>	No	
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>					
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>					
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2185_18



Photo Name: Photo_180721125138



Photo Name: Photo_180721125205



Photo Name: Photo_180721125215



Photo Name: Photo_180721125210



Photo Name: Photo_180721125220



Photo Name: Photo_180721125026

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/21/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2187_18</u>	
Investigators: <u>MNW MD</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>2</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u> Lat: <u>59.892601</u>	Long: <u>-155.328033</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1/EM1B</u>	

Vegetation Type: Shrub Birch – Willow (SBW)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>60</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Spiraea beauverdiana</u>	<u>35</u>	<u>Yes</u>	<u>FACU</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Betula nana</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix arctica</u>	<u>11</u>	<u>No</u>	<u>FAC</u>	FACW species <u>23</u> x2= <u>46</u>
4. <u>Vaccinium uliginosum</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	FAC species <u>92</u> x3= <u>276</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>84</u> x4= <u>336</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>75</u>				Column Totals: <u>199</u> (A) <u>658</u> (B)
50% of total cover: <u>37.5</u>				<u>Prevalence Index = B/A=</u> <u>3.31</u>
20% of total cover: <u>15</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Epilobium angustifolium</u>	<u>30</u>	<u>Yes</u>	<u>FACU</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Rubus chamaemorus</u>	<u>21</u>	<u>Yes</u>	<u>FACW</u>	Morphological Adaptations ¹ (Provide
4. <u>Equisetum sylvaticum</u>	<u>12</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Dryopteris expansa</u>	<u>11</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Equisetum arvense</u>	<u>9</u>	<u>No</u>	<u>FAC</u>	
7. <u>Angelica lucida</u>	<u>8</u>	<u>No</u>	<u>FACU</u>	
8. <u>Poa arctica</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
9. <u>Sedum rosea ssp. integrifolium</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
10. <u>Carex stylosa</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>124</u>				
50% of total cover: <u>62</u>				
20% of total cover: <u>24.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>15</u>				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-10									hor:Oe
10-13									hor:Oa
13-15	10YR 3/2	100					Yes	Sandy Loam	
15-20	2.5Y 4/1	95					Yes	Sandy Loam	

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks: Gravel at 13"

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X				
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2187_18



Photo Name: Photo_180721132544



Photo Name: Photo_180721132549



Photo Name: Photo_180721132539

Additional Reference Data: Photos

HDR2187_18



Photo Name: Photo_180721132453



Photo Name: Photo_180721132512



Photo Name: Photo_180721132534

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/21/2018
 Applicant/Owner: PLP Sampling Point: HDR2188_18
 Investigators: MW MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 12 HGM: Slope
 Subregion (LRR): X Lat: 59.892494 Long: -155.326767 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1B

Vegetation Type: Closed Willow Tall Shrub (CWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	87	Yes	FAC	OBL species <u> </u> x1= <u> </u>
2. <u>Alnus sinuata</u>	3	No	FAC	FACW species <u>18</u> x2= <u>36</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>152</u> x3= <u>456</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>5</u> x4= <u>20</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>175</u> (A) <u>512</u> (B)
Total Cover: <u>90</u>				<u>Prevalence Index = B/A=</u> <u>2.93</u>
50% of total cover: <u>45</u>				
20% of total cover: <u>18</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	30	Yes	FAC	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	20	Yes	FAC	<u>X</u> Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	10	No	FACW	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Anemone richardsonii</u>	5	No	FAC	<u> </u> data in Remarks or on a separate sheet)
5. <u>Epilobium angustifolium</u>	5	No	FACU	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Potentilla anserina</u>	5	No	FACW	
7. <u>Rubus arcticus s.l.</u>	3	No	FAC	¹ Indicators of hydric soil and wetland hydrology
8. <u>Viola langsdoeffii</u>	3	No	FACW	must be present, unless disturbed or problematic.
9. <u>Epilobium ciliatum</u>	2	No	FAC	
10. <u>Polemonium acutiflorum</u>	2	No	FAC	
Total Cover: <u>85</u>				
50% of total cover: <u>42.5</u>				
20% of total cover: <u>17</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>5</u>				Hydrophytic
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u>20</u>				Vegetation
(Where applicable)				Yes <u>X</u> No <u> </u>
Remarks:				Present?

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-18									hor:Oe
18-24	10YR 3/3	100					No	Sandy Loam	hor:B1

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/>	No
Type:					
Depth (inches):					
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/>	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):				
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):				
Saturation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2188_18



Photo Name: Photo_180721141407



Photo Name: Photo_180721141529



Photo Name: Photo_180721141415



Photo Name: Photo_180721141518



Photo Name: Photo_180721141524



Photo Name: Photo_180721141535

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/21/2018
 Applicant/Owner: PLP Sampling Point: HDR2189_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 5 HGM: Slope
 Subregion (LRR): X Lat: 59.892334 Long: -155.326736 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1B

Vegetation Type: Closed Alder Tall Shrub (CATS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Alnus sinuata</u>	<u>90</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by: <u> </u>
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>44</u> x2= <u>88</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>160</u> x3= <u>480</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>6</u> x4= <u>24</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>90</u>				Column Totals: <u>210</u> (A) <u>592</u> (B)
50% of total cover: <u>45</u>				Prevalence Index = B/A= <u>2.82</u>
20% of total cover: <u>18</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Viola langsdorffii</u>	<u>40</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Dominance Test is >50%
2. <u>Athyrium cyclosum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>21</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Calamagrostis canadensis</u>	<u>17</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Pyrola asarifolia</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sanguisorba canadensis</u>	<u>4</u>	<u>No</u>	<u>FACW</u>	
7. <u>Anemone richardsonii</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Trientalis europaea</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>120</u>				
50% of total cover: <u>60</u>				
20% of total cover: <u>24</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>15</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>60</u>				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-12									hor:Oa
12-20									hor:Oe Oeb

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks: H2S at 15"

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X				
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2189_18



Photo Name: Photo_180721144025



Photo Name: Photo_180721144110



Photo Name: Photo_180721144007



Photo Name: Photo_180721144052



Photo Name: Photo_180721144116



Photo Name: Photo_180721144103

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/21/2018
 Applicant/Owner: PLP Sampling Point: HDR2191_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Shoulder Slope
 Local Relief (concave, convex, none): Convex Slope(%): 3 HGM: Slope
 Subregion (LRR): X Lat: 59.892746 Long: -155.324158 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1B

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Prevalence Index worksheet:				
<u>Sapling/Shrub Stratum</u>		Total % Cover of: <u> </u> Multiply by:		
1. <u>Ledum decumbens</u>	<u>61</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Empetrum nigrum</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	FACW species <u>2</u> x2= <u>4</u>
3. <u>Betula nana</u>	<u>8</u>	<u>No</u>	<u>FAC</u>	FAC species <u>119</u> x3= <u>357</u>
4. <u>Vaccinium uliginosum</u>	<u>6</u>	<u>No</u>	<u>FAC</u>	FACU species <u>2</u> x4= <u>8</u>
5. <u>Salix pulchra</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
6. <u>Vaccinium vitis-idaea</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	Column Totals: <u>123</u> (A) <u>369</u> (B)
Total Cover: <u>105</u>				
50% of total cover: <u>52.5</u>				Prevalence Index = B/A= <u>3.00</u>
20% of total cover: <u>21</u>				
Hydrophytic Vegetation Indicators:				
<u>Herb Stratum</u>				X Dominance Test is >50%
1. <u>Carex microchaeta</u>	<u>7</u>	<u>Yes</u>	<u>FAC</u>	X Prevalence Index is ≤3.0
2. <u>Equisetum arvense</u>	<u>7</u>	<u>Yes</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
3. <u>Calamagrostis canadensis</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
4. <u>Rubus chamaemorus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>18</u>				
50% of total cover: <u>9</u>				
20% of total cover: <u>3.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				% Bare Ground <u>0</u>
% Cover of Wetland Bryophytes <u>45</u>		% Cover of Bryophytes <u>65</u>		
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-5									hor:Oi
5-10									hor:Oe
10-19									hor:Oa Cobbles 10%

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: SPD - Somewhat Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 8.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 2.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2191_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Spiraea stevenii</u>	<u>2</u>	<u>No</u>	<u>FACU</u>

Additional Reference Data: Photos

HDR2191_18



Photo Name: Photo_180721155241



Photo Name: Photo_180721155206

Additional Reference Data: Photos

HDR2191_18



Photo Name: Photo_180721155255



Photo Name: Photo_180721155215



Photo Name: Photo_180721155235

Additional Reference Data: Photos

HDR2191_18



Photo Name: Photo_180721155249

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/22/2018
 Applicant/Owner: PLP Sampling Point: HDR2194_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Terrace
 Local Relief (concave, convex, none): Concave Slope(%): 1 HGM: Depressional
 Subregion (LRR): X Lat: 59.883995 Long: -155.315643 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1B

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Equisetum (DEST-EQ)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: DEST-EQ fringe of a PEM1C Eriophorum dominated wetland. Wetter than normal antecedent precipitation.

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
Total Cover: <u> </u>				Prevalence Index worksheet:
50% of total cover: <u>0</u>				
20% of total cover: <u>0</u>				
Sapling/Shrub Stratum				Total % Cover of: <u> </u> Multiply by: <u> </u>
1. <u>Vaccinium uliginosum</u>	55	Yes	FAC	OBL species <u> </u> x1= <u> </u>
2. <u>Empetrum nigrum</u>	40	Yes	FAC	FACW species <u>8</u> x2= <u>16</u>
3. <u>Salix arctica</u>	12	No	FAC	FAC species <u>176</u> x3= <u>528</u>
4. <u>Betula nana</u>	6	No	FAC	FACU species <u>2</u> x4= <u>8</u>
5. <u>Ledum decumbens</u>	6	No	FAC	UPL species <u> </u> x5= <u> </u>
6. <u>Alnus sinuata</u>	4	No	FAC	Column Totals: <u>186</u> (A) <u>552</u> (B)
Total Cover: <u>129</u>				Prevalence Index = B/A = <u>2.97</u>
50% of total cover: <u>64.5</u>				
20% of total cover: <u>25.8</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	35	Yes	FAC	<u>X</u> Dominance Test is >50%
2. <u>Equisetum sylvaticum</u>	10	No	FAC	<u>X</u> Prevalence Index is ≤3.0
3. <u>Carex microchaeta</u>	4	No	FAC	Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet)
4. <u>Rubus chamaemorus</u>	4	No	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)
5. <u>Calamagrostis canadensis</u>	2	No	FAC	
6. <u>Epilobium angustifolium</u>	2	No	FACU	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>57</u>				
50% of total cover: <u>28.5</u>				
20% of total cover: <u>11.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>45</u> % Cover of Bryophytes <u>65</u>				
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-10									hor:Oe
10-20									hor:Oa

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: PD - Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 8.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2194_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Salix fuscescens	4	No	FACW
Salix pulchra	2	No	FAC

Additional Reference Data: Photos

HDR2194_18

Photo Name: Photo_180722080616



Photo Name: Photo_180722080643



Additional Reference Data: Photos

HDR2194_18



Photo Name: Photo_180722080711



Photo Name: Photo_180722080705



Photo Name: Photo_180722080722



Photo Name: Photo_180722080716

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/22/2018
 Applicant/Owner: PLP Sampling Point: HDR2195_18
 Investigators: MW MD Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): None Slope(%): 4 HGM: N/A
 Subregion (LRR): X Lat: 59.884129 Long: -155.315948 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Bluejoint Herb (BH)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67</u> (A/B)
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover:	<u> </u>			Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: OBL species <u> </u> x1= <u> </u> FACW species <u> </u> x2= <u> </u> FAC species <u>88</u> x3= <u>264</u> FACU species <u>40</u> x4= <u>160</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>128</u> (A) <u>424</u> (B) Prevalence Index = B/A= <u>3.31</u>
50% of total cover:	<u>0</u>	20% of total cover:	<u>0</u>	
Sapling/Shrub Stratum				
1. <u>Salix pulchra</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: X Dominance Test is >50% Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover:	<u>15</u>			
50% of total cover:	<u>7.5</u>	20% of total cover:	<u>3</u>	
Herb Stratum				
1. <u>Calamagrostis canadensis</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Epilobium angustifolium</u>	<u>40</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Equisetum sylvaticum</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	
4. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
5. <u>Athyrium cyclosorum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover:	<u>113</u>			
50% of total cover:	<u>56.5</u>	20% of total cover:	<u>22.6</u>	
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>5</u> % Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes ⁵ <u> </u> (Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-4									hor:Oe
4-10	10YR 3/2	100						Sandy Loam	hor:A
10-20	10YR 2/2	30						Silt Loam	40% cobbles, 30% gravel

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: WD - Well Drained	Hydric Soil Present? Yes _____ No _____ X _____
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Remarks: no indicators

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes _____ No _____ X _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ X _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ X _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____ X _____
---	--

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary hydro indicators present

Geomorphic Position:

Additional Reference Data: Photos

HDR2195_18



Photo Name: Photo_180722084330



Photo Name: Photo_180722084215



Photo Name: Photo_180722084318

Additional Reference Data: Photos

HDR2195_18



Photo Name: Photo_180722084229



Photo Name: Photo_180722084310



Photo Name: Photo_180722084303

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/22/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2196_18</u>	
Investigators: <u>MNW MD</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>3</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.884064</u>	Long: <u>-155.316193</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Open Alder – Willow Low Shrub (OAWLS)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Alnus sinuata</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACW species <u>2</u> x2= <u>4</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>166</u> x3= <u>498</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>20</u> x4= <u>80</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>75</u>				Column Totals: <u>188</u> (A) <u>582</u> (B)
50% of total cover: <u>37.5</u>				<u>Prevalence Index = B/A=</u> <u>3.10</u>
20% of total cover: <u>15</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Equisetum sylvaticum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Chamaenerion angustifolium</u>	<u>15</u>	<u>No</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Equisetum arvense</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Trientalis europaea</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Rubus chamaemorus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
7. <u>Cerastium arvense</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>113</u>				
50% of total cover: <u>56.5</u>				
20% of total cover: <u>22.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>30</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>10</u>				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-6									hor:Oe
6-13	7.5YR 3/2	100					No	Silt Loam	hor:B1
13-20	10YR 3/2	100					No	Silt Loam	hor:B2 70% cobbles in B2 layer

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: _____	
Depth (inches): _____	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
Field Drainage Class: SPD - Somewhat Poorly Drained	

Remarks: No indicators

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/>
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 15.0	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 13.0	
(includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
no indicators

Geomorphic Position:

Additional Reference Data: Photos

HDR2196_18



Photo Name: Photo_180722091209



Photo Name: Photo_180722091104



Photo Name: Photo_180722091225

Additional Reference Data: Photos

HDR2196_18



Photo Name: Photo_180722091215



Photo Name: Photo_180722091221



Photo Name: Photo_180722091129

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	7/22/2018
Applicant/Owner:	PLP			Sampling Point:	HDR2197_18
Investigators:	MW MD	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	Convex	Slope(%):	5	HGM:	N/A
Subregion (LRR):	X	Lat:	59.886993	Long:	-155.316681
		Datum:	WGS84		
Soil Map Unit Name:	N/A	NWI Classification:	U		

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u> </u> X
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			

Tree Stratum		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:			
1.					Number of Dominant Species			
2.					That Are OBL, FACW, or FAC: 3 (A)			
3.					Total Number of Dominant			
4.					Species Across All Strata: 4 (B)			
Total Cover:					Percent of Dominant Species			
50% of total cover: 0					That Are OBL, FACW, or FAC: 75 (A/B)			
20% of total cover: 0								
Sapling/Shrub Stratum					Prevalence Index worksheet:			
1.	Salix pulchra	35	Yes	FAC	Total % Cover of:		Multiply by:	
2.	Betula nana	25	Yes	FAC	OBL species	x1=		
3.	Spiraea beauverdiana	15	No	FACU	FACW species	5 x2=	10	
4.	Alnus sinuata	10	No	FAC	FAC species	138 x3=	414	
5.	Ledum decumbens	5	No	FAC	FACU species	41 x4=	164	
6.	Salix barclayi	5	No	FAC	UPL species	x5=		
Total Cover: 100					Column Totals:	184 (A)	588 (B)	
50% of total cover: 50					Prevalence Index = B/A= 3.20			
20% of total cover: 20								
Herb Stratum					Hydrophytic Vegetation Indicators:			
1.	Calamagrostis canadensis	35	Yes	FAC	X	Dominance Test is >50%		
2.	Epilobium angustifolium	25	Yes	FACU		Prevalence Index is ≤3.0		
3.	Equisetum arvense	15	No	FAC		Morphological Adaptations ¹ (Provide		
4.	Sanguisorba canadensis	3	No	FACW		data in Remarks or on a separate sheet)		
5.	Athyrium cyclosorum	2	No	FAC		Problematic Hydrophytic Vegetation ¹ (Explain)		
6.	Rubus chamaemorus	2	No	FACW				
7.	Aconitum delphiniifolium	1	No	FAC				
8.	Angelica lucida	1	No	FACU				
9.								
10.								
Total Cover: 84					¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.			
50% of total cover: 42								
20% of total cover: 16.8								
Plot size (radius, or length x width) 1/10 acre					Hydrophytic Vegetation Present? Yes X No			
% Cover of Wetland Bryophytes 0 (Where applicable)					% Cover of Bryophytes 25			

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-7									hor:Oe
7-11	10YR 2/2	40					No	Sandy Loam	hor:A 60% cobble
11-12	5GY 2.5/1	100					Yes	Sandy Clay Loam	hor:E
12-24	10YR 4/6	35					No	Sandy Clay Loam	hor:B
12-24	2.5Y 4/4	65					No	Sandy Clay Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:

Indicators for Problematic Hydric Soils³:

☐ Histosol or Histel (A1)

☐ Histic Epipedon (A2)

☐ Hydrogen Sulfide (A4)

☐ Thick Dark Surface (A12)

☐ Alaska Gleyed (A13)

☐ Alaska Redox (A14)

☐ Alaska Gleyed Pores (A15)

☐ Alaska Color Change (TA4)⁴

☐ Alaska Alpine Swales (TA5)

☐ Alaska Redox With 2.5Y Hue

☐ Alaska Gleyed Without Hue 5Y or Redder

☐ Underlying Layer

☐ Other (Explain in Remarks)

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

Restrictive Layer (if present):

Type:

Depth (inches):

Field Drainage Class: SPD - Somewhat Poorly Drained

Hydric Soil Present?

Yes

No

X

Remarks: no indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

☐ Surface Water (A1)

☐ High Water Table (A2)

☒ Saturation (A3)

☐ Water Marks (B1)

☐ Sediment Deposits (B2)

☐ Drift Deposits (B3)

☐ Algal Mat or Crust (B4)

☐ Iron Deposits (B5)

☐ Surface Soil Cracks (B6)

☐ Inundation Visible on Aerial Imagery (B7)

☐ Sparsely Vegetated Concave Surface (B8)

☐ Marl Deposits (B15)

☐ Hydrogen Sulfide Odor (C1)

☐ Dry Season Water Table (C2)

☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

☐ Water-stained Leaves (B9)

☐ Drainage Patterns (B10)

☐ Oxidized Rhizospheres along Living Roots (C3)

☒ Presence of Reduced Iron (C4)

☐ Salt Deposits (C5)

☐ Stunted or Stressed Plants (D1)

☐ Geomorphic Position (D2)

☐ Shallow Aquitard (D3)

☐ Microtopographic Relief (D4)

☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?

Yes

No

X

Depth (inches):

Water Table Present?

Yes

X

No

Depth (inches):

21.0

Saturation Present?

Yes

X

No

Depth (inches):

9.0

(includes capillary fringe)

Wetland Hydrology Present?

Yes

X

No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2197_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Vaccinium uliginosum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>

Additional Reference Data: Photos

HDR2197_18



Photo Name: Photo_180722102944



Photo Name: Photo_180722102940



Photo Name: Photo_180722102951



Photo Name: Photo_180722102842



Photo Name: Photo_180722102934

Photo Name: Photo_180722102920



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/22/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2200_18</u>	
Investigators: <u>MNW MD</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>3</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.888248</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Closed Alder – Willow Tall Shrub (CAWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Alnus sinuata</u>	<u>65</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u>5</u> <u>Multiply by:</u>
2. <u>Salix pulchra</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>5</u> x1= <u>5</u>
3. <u>Spiraea stevenii</u>	<u>4</u>	<u>No</u>	<u>FACU</u>	FACW species <u>16</u> x2= <u>32</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>177</u> x3= <u>531</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>7</u> x4= <u>28</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>99</u>				Column Totals: <u>205</u> (A) <u>596</u> (B)
50% of total cover: <u>49.5</u>				<u>Prevalence Index = B/A=</u> <u>2.91</u>
20% of total cover: <u>19.8</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Viola langsdorffii</u>	<u>15</u>	<u>No</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Comarum palustre</u>	<u>5</u>	<u>No</u>	<u>OBL</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Anemone richardsonii</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Pyrola minor</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
7. <u>Rubus arcticus s.l.</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Trientalis europaea</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	must be present, unless disturbed or problematic.
9. <u>Cerastium beeringianum</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
10. <u>Streptopus amplexifolius</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>106</u>				
50% of total cover: <u>53</u>				
20% of total cover: <u>21.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>10</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes <u>25</u>				
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-8									hor:Oe
8-20									hor:Oa Chunks of wood pieces present

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	PD - Poorly Drained				

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):				
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 8.0				
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2200_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Cardamine umbellata	1	No	FACW

Additional Reference Data: Photos

HDR2200_18



Photo Name: Photo_180722122426



Photo Name: Photo_180722122401

Additional Reference Data: Photos

HDR2200_18



Photo Name: Photo_180722122306



Photo Name: Photo_180722122354



Photo Name: Photo_180722122320



Photo Name: Photo_180722122406

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/22/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2202_18</u>	
Investigators: <u>MNW MD</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>1</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.891441</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1/EM1B</u>	

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: <u>Adjacent to PEM1C. Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67</u> (A/B)
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u> </u>				Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: OBL species <u> </u> x1= <u> </u> FACW species <u>9</u> x2= <u>18</u> FAC species <u>135</u> x3= <u>405</u> FACU species <u>25</u> x4= <u>100</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>169</u> (A) <u>523</u> (B) Prevalence Index = B/A= <u>3.09</u>
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
Sapling/Shrub Stratum				
1. <u>Salix pulchra</u>	60	Yes	FAC	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>60</u>				Hydrophytic Vegetation Indicators: X Dominance Test is >50% Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
50% of total cover: <u>30</u>		20% of total cover: <u>12</u>		
Herb Stratum				
1. <u>Calamagrostis canadensis</u>	70	Yes	FAC	
2. <u>Dryopteris expansa</u>	25	Yes	FACU	
3. <u>Sanguisorba canadensis</u>	9	No	FACW	
4. <u>Equisetum arvense</u>	5	No	FAC	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>109</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>54.5</u>		20% of total cover: <u>21.8</u>		
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>35</u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u>0</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-9									hor:Oa
9-13	10YR 4/3	100					No	Loamy Sand	hor:B1 50% gravel
13-20	10YR 4/4	100					No	Loamy Sand	hor:B2 40% gravel

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X				
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2202_18



Photo Name: Photo_180722135458



Photo Name: Photo_180722135448



Photo Name: Photo_180722135518

Additional Reference Data: Photos

HDR2202_18



Photo Name: Photo_180722135421



Photo Name: Photo_180722135453



Photo Name: Photo_180722135409

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	7/22/2018
Applicant/Owner:	PLP			Sampling Point:	HDR2203_18
Investigators:	MW MD	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	None	Slope(%):	10	HGM:	Slope
Subregion (LRR):	X	Lat:	59.891247	Long:	-155.323227
				Datum:	WGS84
Soil Map Unit Name:	N/A		NWI Classification:	PSS1B	

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> X </u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			

Tree Stratum				Dominance Test Worksheet:			
		Absolute % Cover	Dominant Species?	Indicator Status	Number of Dominant Species		
1.					That Are OBL, FACW, or FAC: 4 (A)		
2.					Total Number of Dominant		
3.					Species Across All Strata: 4 (B)		
4.					Percent of Dominant Species		
Total Cover:					That Are OBL, FACW, or FAC: 100 (A/B)		
50% of total cover:		0	20% of total cover:		0		
Sapling/Shrub Stratum				Prevalence Index worksheet:			
					Total % Cover of: Multiply by:		
1.	Salix barclayi	40	Yes	FAC	OBL species	5	x1= 5
2.	Salix pulchra	30	Yes	FAC	FACW species	33	x2= 66
3.	Vaccinium oxycoccos	5	No	OBL	FAC species	122	x3= 366
4.					FACU species	5	x4= 20
5.					UPL species		x5=
6.					Column Totals:	165 (A)	457 (B)
Total Cover:		75					
50% of total cover:		37.5	20% of total cover:		15		
Herb Stratum				Prevalence Index = B/A= 2.77			
					Hydrophytic Vegetation Indicators:		
1.	Equisetum arvense	40	Yes	FAC	X	Dominance Test is >50%	
2.	Sanguisorba canadensis	20	Yes	FACW	X	Prevalence Index is ≤3.0	
3.	Viola langsdorffii	10	No	FACW		Morphological Adaptations ¹ (Provide	
4.	Epilobium angustifolium	5	No	FACU		data in Remarks or on a separate sheet)	
5.	Anemone richardsonii	3	No	FAC		Problematic Hydrophytic Vegetation ¹ (Explain)	
6.	Poa arctica	3	No	FAC			
7.	Petasites frigidus s.l.	3	No	FACW			
8.	Calamagrostis canadensis	2	No	FAC			
9.	Carex bigelowii	2	No	FAC			
10.	Polemonium acutiflorum	2	No	FAC			
Total Cover:		90					
50% of total cover:		45	20% of total cover:		18		
Plot size (radius, or length x width) 1/10 acre				% Bare Ground			
% Cover of Wetland Bryophytes 60		% Cover of Bryophytes 60					
(Where applicable)							
				Hydrophytic Vegetation Present? Yes X No			

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-12									hor:Oe
12-20	10GY 3/1	70	5YR 4/6	30	C	PL RC	No	Sandy Clay Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: PD - Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 12.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 6.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:



Photo Name: Photo_180722143215



Photo Name: Photo_180722143200



Photo Name: Photo_180722143100



Photo Name: Photo_180722143206



Photo Name: Photo_180722143211



Photo Name: Photo_180722143052

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/22/2018
 Applicant/Owner: PLP Sampling Point: HDR2207_18
 Investigators: MW MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 5 HGM: Slope
 Subregion (LRR): X Lat: 59.887890 Long: -155.302643 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1B

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Vaccinium uliginosum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Empetrum nigrum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>5</u> x2= <u>10</u>
4. <u>Spiraea beauverdia</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	FAC species <u>125</u> x3= <u>375</u>
5. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>13</u> x4= <u>52</u>
6. <u>Vaccinium vitis-idaea</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>97</u>				Column Totals: <u>143</u> (A) <u>437</u> (B)
50% of total cover: <u>48.5</u>				Prevalence Index = B/A= <u>3.06</u>
20% of total cover: <u>19.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Carex bigelowii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Morphological Adaptations ¹ (Provide
4. <u>Rubus chamaemorus</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	data in Remarks or on a separate sheet)
5. <u>Equisetum sylvaticum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Epilobium angustifolium</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>46</u>				
50% of total cover: <u>23</u>				
20% of total cover: <u>9.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u> </u> % Cover of Bryophytes <u> </u>				
(Where applicable)				
Remarks: <u>Willows part of CAWTS</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-10									hor:Oe
10-20	10YR 3/2	80					No	Fine Sandy Loam	hor:B
10-20	10YR 4/3	20					No	Fine Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	SPD - Somewhat Poorly Drained				

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X				
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Photo Name: Photo_180722160023



Photo Name: Photo_180722160326



Photo Name: Photo_180722160017



Additional Reference Data: Photos

HDR2207_18



Photo Name: Photo_180722160036



Photo Name: Photo_180722160344



Photo Name: Photo_180722160030

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/23/2018
 Applicant/Owner: PLP Sampling Point: HDR2208_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 6 HGM: N/A
 Subregion (LRR): X Lat: 59.925995 Long: -155.310562 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Closed Willow Tall Shrub (CWTS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67</u> (A/B)
Tree Stratum				
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover:	<u> </u>			
50% of total cover:	<u>0</u>	20% of total cover:	<u>0</u>	
Sapling/Shrub Stratum				
1. <u>Salix pulchra</u>	<u>85</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index worksheet: <u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> OBL species <u> </u> x1= <u> </u> FACW species <u>8</u> x2= <u>16</u> FAC species <u>159</u> x3= <u>477</u> FACU species <u>36</u> x4= <u>144</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>203</u> (A) <u>637</u> (B) <i>Prevalence Index = B/A=</i> <u>3.14</u>
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover:	<u>85</u>			
50% of total cover:	<u>42.5</u>	20% of total cover:	<u>17</u>	
Herb Stratum				
1. <u>Calamagrostis canadensis</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <u>X</u> Dominance Test is >50% <u> </u> Prevalence Index is ≤3.0 <u> </u> Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
2. <u>Dryopteris expansa</u>	<u>25</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Heracleum maximum</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
4. <u>Sanguisorba canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
5. <u>Epilobium angustifolium</u>	<u>4</u>	<u>No</u>	<u>FACU</u>	
6. <u>Viola langsdorffii</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	
7. <u>Anemone richardsonii</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
8. <u>Rubus arcticus s.l.</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
9. <u>Angelica lucida</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover:	<u>118</u>			
50% of total cover:	<u>59</u>	20% of total cover:	<u>23.6</u>	
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>4</u> % Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u>20</u> (Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-9	10YR 2/2	100					N/A	Silt Loam	hor:A
9-18	10YR 3/2	100					N/A	Silt Loam	hor:B1
18-22	10YR 3/3	100					N/A	Silt Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: _____	
Depth (inches): _____	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
Field Drainage Class: WD - Well Drained	

Remarks: no indicators

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
(includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
no water or saturation in pit

Geomorphic Position:

Additional Reference Data: Photos

HDR2208_18



Photo Name: Photo_180723080636



Photo Name: Photo_180723080644



Photo Name: Photo_180723080650

Additional Reference Data: Photos

HDR2208_18



Photo Name: Photo_180723081320



Photo Name: Photo_180723080655



Photo Name: Photo_180723081337

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	7/23/2018
Applicant/Owner:	PLP			Sampling Point:	HDR2209_18
Investigators:	MW MD	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	None	Slope(%):	5	HGM:	N/A
Subregion (LRR):	X	Lat:	59.926205	Long:	-155.311050
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	U		

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>			

Tree Stratum		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:			
1.					Number of Dominant Species			
2.					That Are OBL, FACW, or FAC: 2 (A)			
3.					Total Number of Dominant			
4.					Species Across All Strata: 2 (B)			
Total Cover:					Percent of Dominant Species			
50% of total cover: 0					That Are OBL, FACW, or FAC: 100 (A/B)			
20% of total cover: 0								
Sapling/Shrub Stratum					Prevalence Index worksheet:			
1.	Salix pulchra	40	Yes	FAC	Total % Cover of:		Multiply by:	
2.					OBL species	x1=		
3.					FACW species	10	x2=	20
4.					FAC species	112	x3=	336
5.					FACU species	18	x4=	72
6.					UPL species		x5=	
Total Cover: 40					Column Totals:	140	(A)	428 (B)
50% of total cover: 20					Prevalence Index = B/A= 3.06			
20% of total cover: 8								
Herb Stratum					Hydrophytic Vegetation Indicators:			
1.	Calamagrostis canadensis	60	Yes	FAC	X	Dominance Test is >50%		
2.	Heracleum maximum	10	No	FACU		Prevalence Index is ≤3.0		
3.	Sanguisorba canadensis	10	No	FACW		Morphological Adaptations ¹ (Provide		
4.	Dryopteris expansa	5	No	FACU		data in Remarks or on a separate sheet)		
5.	Aconitum delphiniifolium	3	No	FAC		Problematic Hydrophytic Vegetation ¹ (Explain)		
6.	Equisetum arvense	3	No	FAC	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.			
7.	Rubus arcticus s.l.	3	No	FAC				
8.	Veratrum viride	3	No	FAC				
9.	Epilobium angustifolium	3	No	FACU	Hydrophytic Vegetation Present? Yes X No			
10.								
Total Cover: 100								
50% of total cover: 50								
20% of total cover: 20								
Plot size (radius, or length x width) 1/10 acre					% Bare Ground			
% Cover of Wetland Bryophytes (Where applicable)					% Cover of Bryophytes			

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-9	10YR 2/2	100						Silt Loam	hor:A
9-16	10YR 3/2	100						Loam	hor:B1
16-22	10YR 3/4	100						Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: WD - Well Drained	Hydric Soil Present? Yes _____ No _____ X _____
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Remarks: No indicators

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes _____ No _____ X _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ X _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ X _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____ X _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydro indicators present.

Geomorphic Position:

Additional Reference Data: Photos

HDR2209_18



Photo Name: Photo_180723083642



Photo Name: Photo_180723083633



Photo Name: Photo_180723083232

Additional Reference Data: Photos

HDR2209_18



Photo Name: Photo_180723083239



Photo Name: Photo_180723083227



Photo Name: Photo_180723083221

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/23/2018
 Applicant/Owner: PLP Sampling Point: HDR2211_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 7 HGM: N/A
 Subregion (LRR): X Lat: 59.928795 Long: -155.311691 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: <u>Fringe of DEST between CWTS and DESLT. Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>75</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	Total % Cover of: <u> </u> Multiply by:
2. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Ledum decumbens</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACW species <u>5</u> x2= <u>10</u>
4. <u>Spiraea beauverdana</u>	<u>4</u>	<u>No</u>	<u>FACU</u>	FAC species <u>132</u> x3= <u>396</u>
5. <u>Vaccinium vitis-idaea</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FACU species <u>17</u> x4= <u>68</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>106</u>				Column Totals: <u>154</u> (A) <u>474</u> (B)
50% of total cover: <u>53</u>				Prevalence Index = B/A= <u>3.08</u>
20% of total cover: <u>21.2</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Epilobium angustifolium</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Carex podocarpa</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Rubus chamaemorus</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Lycopodium annotinum s.l.</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
7. <u>Trientalis europaea</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>48</u>				
50% of total cover: <u>24</u>				
20% of total cover: <u>9.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>80</u>				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-6									hor:Oi
6-8	10YR 5/2	100					N/A	Fine Sandy Loam	hor:A
8-10	10YR 3/2	100					N/A	Sandy Loam	hor:B
10-13	10YR 3/3	100					N/A	Sandy Loam	hor:B1 Gravel below 10"
13-20	10YR 4/3	100					N/A	Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: _____	
Depth (inches): _____	
Field Drainage Class: WD - Well Drained	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>

Remarks: no indicators

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches): _____	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches): _____	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No indicators

Geomorphic Position:



Photo Name: Photo_180723091914



Photo Name: Photo_180723091708



Photo Name: Photo_180723091720



Photo Name: Photo_180723091905



Photo Name: Photo_180723091714



Photo Name: Photo_180723091701

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/23/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2214_18</u>	
Investigators: <u>MNW MD</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>6</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.928799</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil X or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>		
Remarks: Restrictive soil layer at 4-inches. Wetter than normal antecedent precipitation		

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>85</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Vaccinium uliginosum</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Salix pulchra</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACW species <u>1</u> x2= <u>2</u>
4. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>154</u> x3= <u>462</u>
5. <u>Vaccinium vitis-idaea</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	FACU species <u>6</u> x4= <u>24</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>137</u>				Column Totals: <u>161</u> (A) <u>488</u> (B)
50% of total cover: <u>68.5</u>				<u>Prevalence Index = B/A=</u> <u>3.03</u>
20% of total cover: <u>27.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	<u>7</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex microchaeta</u>	<u>6</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Lycopodium annotinum s.l.</u>	<u>4</u>	<u>No</u>	<u>FACU</u>	Morphological Adaptations ¹ (Provide
4. <u>Calamagrostis canadensis</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Cornus suecica</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Luzula parviflora</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
7. <u>Pyrola asarifolia</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
8. <u>Streptopus amplexifolius</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
9. <u>Pedicularis langsдорffii</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	must be present, unless disturbed or problematic.
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>24</u>				
50% of total cover: <u>12</u>				
20% of total cover: <u>4.8</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>35</u>				
% Cover of Bryophytes <u>45</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-13	2.5Y 4/3	90	10YR 4/4	10	C	PL	No	Sandy Clay Loam	hor:B1
13-20	2.5Y 5/2	100						Sandy Loam	hor:B2 60% gravel

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input checked="" type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
Type: clay loam layer						
Depth (inches): 4						
Field Drainage Class: SPD - Somewhat Poorly Drained						

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):					
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	6.0				
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	4.0				
(includes capillary fringe)						

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
hummocky DEST located just below a steeper upland slope and a ponded PEM1C terrace

Geomorphic Position:

Additional Reference Data: Photos

HDR2214_18



Photo Name: Photo_180723102530



Photo Name: Photo_180723102526



Photo Name: Photo_180723102536

Additional Reference Data: Photos

HDR2214_18



Photo Name: Photo_180723102451



Photo Name: Photo_180723102518



Photo Name: Photo_180723102431

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/23/2018
 Applicant/Owner: PLP Sampling Point: HDR2215_18
 Investigators: MW MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 4 HGM: Slope
 Subregion (LRR): X Lat: 59.929100 Long: -155.315918 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1B

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Betula nana</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Empetrum nigrum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Ledum decumbens</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	FACW species <u>10</u> x2= <u>20</u>
4. <u>Vaccinium uliginosum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FAC species <u>107</u> x3= <u>321</u>
5. <u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>8</u> x4= <u>32</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>80</u>				Column Totals: <u>125</u> (A) <u>373</u> (B)
50% of total cover: <u>40</u>				<u>Prevalence Index = B/A=</u> <u>2.98</u>
20% of total cover: <u>16</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Rubus chamaemorus</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Carex bigelowii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Epilobium angustifolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Dryopteris expansa</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
7. <u>Poa arctica</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>45</u>				
50% of total cover: <u>22.5</u>				
20% of total cover: <u>9</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u> </u>				Hydrophytic
% Cover of Wetland Bryophytes <u>40</u> % Cover of Bryophytes <u>40</u>				Vegetation
(Where applicable)				Yes <u>X</u> No <u> </u>
				Present?

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-16									hor:Oe
16-20	10YR 3/2	100						Silt Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: PD - Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
---	---

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 16.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 11.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2215_18



Photo Name: Photo_180723112044



Photo Name: Photo_180723111929



Photo Name: Photo_180723111919

Additional Reference Data: Photos

HDR2215_18



Photo Name: Photo_180723111934



Photo Name: Photo_180723112050



Photo Name: Photo_180723111924

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/23/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2216_18</u>	
Investigators: <u>MNW MD</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>4</u>	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.929253</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Closed Willow Low Shrub (CWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>2</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Salix pulchra</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>10</u> x1= <u>10</u>
2. <u>Spiraea beauverdiana</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	FACW species <u>6</u> x2= <u>12</u>
3. <u>Betula nana</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	FAC species <u>176</u> x3= <u>528</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>13</u> x4= <u>52</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>205</u> (A) <u>602</u> (B)
Total Cover: <u>84</u>				<u>Prevalence Index = B/A=</u> <u>2.94</u>
50% of total cover: <u>42</u>				
20% of total cover: <u>16.8</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Equisetum arvense</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>11</u>	<u>No</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Comarum palustre</u>	<u>10</u>	<u>No</u>	<u>OBL</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Polemonium acutiflorum</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u>Dryopteris expansa</u>	<u>4</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Viola langsdoeffii</u>	<u>4</u>	<u>No</u>	<u>FACW</u>	
7. <u>Rubus arcticus s.l.</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Epilobium angustifolium</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	must be present, unless disturbed or problematic.
9. <u>Trientalis europaea</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
10. <u>Rubus chamaemorus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>121</u>				
50% of total cover: <u>60.5</u>				
20% of total cover: <u>24.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>70</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>80</u>				Present?
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-5									hor:Oe
5-20							N/A		hor:Oa Cobbles below 10"

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: PD - Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
---	---

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 10.0 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 4.0 (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2216_18



Photo Name: Photo_180723122734



Photo Name: Photo_180723122728



Photo Name: Photo_180723122740

Additional Reference Data: Photos

HDR2216_18



Photo Name: Photo_180723123006



Photo Name: Photo_180723122935



Photo Name: Photo_180723122746

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	7/23/2018
Applicant/Owner:	PLP			Sampling Point:	HDR2217_18
Investigators:	MW MD	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	None	Slope(%):	6	HGM:	Slope
Subregion (LRR):	X	Lat:	59.929676	Long:	-155.316101
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	PSS1B		

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> X </u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			

Tree Stratum				Dominance Test Worksheet:				
Tree Stratum		Absolute % Cover	Dominant Species?	Indicator Status	Number of Dominant Species			
1.					That Are OBL, FACW, or FAC: 4 (A)			
2.					Total Number of Dominant			
3.					Species Across All Strata: 4 (B)			
4.					Percent of Dominant Species			
Total Cover:					That Are OBL, FACW, or FAC: 100 (A/B)			
50% of total cover:		0	20% of total cover:		0			
Sapling/Shrub Stratum				Prevalence Index worksheet:				
1.	Salix barclayi	50	Yes	FAC	Total % Cover of:		Multiply by:	
2.	Salix pulchra	30	Yes	FAC	OBL species	1	x1= 1	
3.	Betula nana	10	No	FAC	FACW species	18	x2= 36	
4.	Alnus sinuata	5	No	FAC	FAC species	137	x3= 411	
5.	Spiraea beauverdiana	3	No	FACU	FACU species	3	x4= 12	
6.	Ledum decumbens	2	No	FAC	UPL species	1	x5= 5	
Total Cover:		102			Column Totals:	160 (A)	465 (B)	
50% of total cover:		51	20% of total cover:		20.4	Prevalence Index = B/A= 2.91		
Herb Stratum				Hydrophytic Vegetation Indicators:				
1.	Calamagrostis canadensis	20	Yes	FAC	X	Dominance Test is >50%		
2.	Equisetum arvense	10	Yes	FAC	X	Prevalence Index is ≤3.0		
3.	Petasites frigidus s.l.	5	No	FACW	Morphological Adaptations ¹ (Provide			
4.	Potentilla anserina	5	No	FACW	data in Remarks or on a separate sheet)			
5.	Sanguisorba canadensis	3	No	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)			
6.	Viola langsdorffii	3	No	FACW				
7.	Anemone richardsonii	2	No	FAC	¹ Indicators of hydric soil and wetland hydrology			
8.	Carex bigelowii	2	No	FAC	must be present, unless disturbed or problematic.			
9.	Rubus arcticus s.l.	2	No	FAC				
10.	Rubus chamaemorus	2	No	FACW				
Total Cover:		58						
50% of total cover:		29	20% of total cover:		11.6			
Plot size (radius, or length x width) 1/10 acre				% Bare Ground	0			
% Cover of Wetland Bryophytes 40				% Cover of Bryophytes	40			
(Where applicable)								
Hydrophytic Vegetation Present?				Yes X No				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-16									hor:Oa
16-20	10YR 2/2	80					Yes	Sandy Clay Loam	hor:B
16-20	7.5YR 3/1	20					Yes	Sandy Clay Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	PD - Poorly Drained				

Remarks: H2S at 16"

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):				
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):				
Saturation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches):				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

H2S at 16"

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2217_18

	Absolute % Cover	Dominant Species?	Indicator Status
Herb			
Cerastium beeringianum	1	No	FAC
Poa arctica	1	No	FAC
Pyrola grandiflora	1	No	FAC
Artemisia arctica	1	No	NL
Sapling/Shrub			
Vaccinium vitis-idaea	1	No	FAC
Vaccinium oxycoccos	1	No	OBL

Additional Reference Data: Photos

HDR2217_18



Photo Name: Photo_180723125926



Photo Name: Photo_180723130005



Photo Name: Photo_180723125953



Photo Name: Photo_180723125959



Photo Name: Photo_180723125948

Photo Name: Photo_180723125754



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/23/2018
 Applicant/Owner: PLP Sampling Point: HDR2220_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 5 HGM: N/A
 Subregion (LRR): X Lat: 59.929939 Long: -155.315567 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
<u>Tree Stratum</u>				Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>4</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		That Are OBL, FACW, or FAC: <u>100</u> (A/B)
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Vaccinium uliginosum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Ledum decumbens</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
4. <u>Vaccinium vitis-idaea</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FAC species <u>165</u> x3= <u>495</u>
5. <u>Betula nana</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FACU species <u>4</u> x4= <u>16</u>
6. <u>Spiraea beauverdiana</u>	<u>4</u>	<u>No</u>	<u>FACU</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>154</u>				Column Totals: <u>169</u> (A) <u>511</u> (B)
50% of total cover: <u>77</u>		20% of total cover: <u>30.8</u>		<u>Prevalence Index = B/A=</u> <u>3.02</u>
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>8</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>7</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Prevalence Index is ≤3.0
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>15</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>7.5</u>		20% of total cover: <u>3</u>		
Plot size (radius, or length x width) <u>1/10 acre</u>		% Bare Ground <u>0</u>		
% Cover of Wetland Bryophytes <u>30</u>		% Cover of Bryophytes <u>40</u>		
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-6									hor:Oi
6-8									hor:Oe Not saturated organic horizon
8-11	7.5YR 3/2	100					No	Sandy Loam	hor:B1 70% gravel
11-20	10YR 4/3	100					No	Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: _____	
Depth (inches): _____	Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input type="checkbox"/>
Field Drainage Class: MWD - Moderately Well Drained	

Remarks: Histic Epipedon (A2) not indicated due to lack of saturation despite wetter than normal antecedent precipitation.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes <input checked="" type="checkbox"/> X <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): 17.0	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>
(includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
no indicators

Geomorphic Position:

Additional Reference Data: Photos

HDR2220_18



Photo Name: Photo_180723135246



Photo Name: Photo_180723135344



Photo Name: Photo_180723135337



Photo Name: Photo_180723135309



Photo Name: Photo_180723135331



Photo Name: Photo_180723135326

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/23/2018
 Applicant/Owner: PLP Sampling Point: HDR2221_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): None Slope(%): 7 HGM: N/A
 Subregion (LRR): X Lat: 59.929703 Long: -155.315430 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Prevalence Index worksheet:				
Total % Cover of:		Multiply by:		
OBL species	<u> </u>	x1= <u> </u>		
FACW species	<u> </u>	x2= <u> </u>		
FAC species	<u>107</u>	x3= <u>321</u>		
FACU species	<u>5</u>	x4= <u>20</u>		
UPL species	<u>3</u>	x5= <u>15</u>		
Column Totals:	<u>115</u> (A)	<u>356</u> (B)		
Prevalence Index = B/A=				<u>3.10</u>
Hydrophytic Vegetation Indicators:				
X Dominance Test is >50%				
Prevalence Index is ≤3.0				
Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet)				
Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>				

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Empetrum nigrum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Vaccinium uliginosum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Betula nana</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	
4. <u>Ledum decumbens</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
5. <u>Spiraea beauverdiana</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
6. <u>Salix pulchra</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>102</u>				
50% of total cover: <u>51</u>				
20% of total cover: <u>20.4</u>				
Herb Stratum				
1. <u>Carex bigelowii</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Equisetum arvense</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Cornus suecica</u>	<u>3</u>	<u>Yes</u>	<u>FAC</u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>13</u>				
50% of total cover: <u>6.5</u>				
20% of total cover: <u>2.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u> % Cover of Bryophytes <u>20</u>				
(Where applicable)				

Remarks:
 Trace: Vac vit.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-4									hor:Oe
4-8	7.5YR 3/2	100					No	Sandy Loam	hor:A
8-20	2.5Y 4/3	97	7.5YR 4/4	3	C		No	Sandy Clay Loam	hor:B *4

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):	
Type: _____	
Depth (inches): _____	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Field Drainage Class: SPD - Somewhat Poorly Drained	

Remarks: No indicators. Not considered to meet 2.5Y Hue - problematic because of the low % of redox and because the saturation occurred below 18" ⁴: Does not meet problematic because low % of redox found. Soil also not saturated within the top 12" of the mineral layers.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 18.0	
(includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No indicators

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2221_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Arctostaphylos uva-ursi	3	No	UPL
Salix arctica	1	No	FAC

Additional Reference Data: Photos

HDR2221_18



Photo Name: Photo_180723143849



Photo Name: Photo_180723143923



Photo Name: Photo_180723143917



Photo Name: Photo_180723143900



Photo Name: Photo_180723143907



Photo Name: Photo_180723143912

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	7/23/2018
Applicant/Owner:	PLP			Sampling Point:	HDR2222_18
Investigators:	MNW MD	Landform (hillslope, terrace, etc.):	Hillslope		
Local Relief (concave, convex, none):	Concave	Slope(%):	4	HGM:	Slope
Subregion (LRR):	X	Lat:	59.929462	Long:	-155.315704
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	PSS1B		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>		Absolute % Cover	Dominant Species?	Indicator Status
1.				
2.				
3.				
4.				
Total Cover:				
50% of total cover:		0	20% of total cover:	0
<u>Sapling/Shrub Stratum</u>				
1.	Salix pulchra	60	Yes	FAC
2.	Alnus sinuata	30	Yes	FAC
3.				
4.				
5.				
6.				
Total Cover:		90		
50% of total cover:		45	20% of total cover:	18
<u>Herb Stratum</u>				
1.	Calamagrostis canadensis	70	Yes	FAC
2.	Equisetum arvense	35	Yes	FAC
3.	Dryopteris expansa	25	No	FACU
4.	Viola langsdorffii	4	No	FACW
5.	Anemone richardsonii	2	No	FAC
6.	Trientalis europaea	1	No	FACU
7.	Cardamine umbellata	1	No	FACW
8.				
9.				
10.				
Total Cover:		138		
50% of total cover:		69	20% of total cover:	27.6
Plot size (radius, or length x width) 1/10 acre			% Bare Ground	15
% Cover of Wetland Bryophytes 0			% Cover of Bryophytes 15	
(Where applicable)				

Dominance Test Worksheet:

Number of Dominant Species _____

That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species x1= _____

FACW species 5 x2= 10

FAC species 197 x3= 591

FACU species 26 x4= 104

UPL species x5= _____

Column Totals: 228 (A) 705 (B)

Prevalence Index = B/A= 3.09

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

_____ Prevalence Index is ≤3.0

_____ Morphological Adaptations¹ (Provide data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present?

Yes X No _____

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-9									hor:Oe
9-12									hor:Oa
12-20	2.5Y 4/3	100					No	Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	PD - Poorly Drained				

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:									
Surface Water Present?	Yes	<u> </u>	No	<u> X </u>	Depth (inches):	<u> </u>			
Water Table Present?	Yes	<u> X </u>	No	<u> </u>	Depth (inches):	<u> 10.0 </u>			
Saturation Present?	Yes	<u> X </u>	No	<u> </u>	Depth (inches):	<u> 4.0 </u>			
(includes capillary fringe)					Wetland Hydrology Present? Yes <u> X </u> No <u> </u>				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2222_18



Photo Name: Photo_180723152159



Photo Name: Photo_180723152216



Photo Name: Photo_180723152120

Additional Reference Data: Photos

HDR2222_18



Photo Name: Photo_180723152210



Photo Name: Photo_180723152144



Photo Name: Photo_180723152205

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/24/2018
 Applicant/Owner: PLP Sampling Point: HDR2223_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): Concave Slope(%): 0 HGM: N/A
 Subregion (LRR): X Lat: 59.900661 Long: -155.270721 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Bluejoint Herb (BH)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Vaccinium uliginosum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Empetrum nigrum</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>4</u> x2= <u>8</u>
3. <u>Salix arctica</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	FAC species <u>116</u> x3= <u>348</u>
4. <u>Spiraea beauverdiana</u>	<u>4</u>	<u>No</u>	<u>FACU</u>	FACU species <u>4</u> x4= <u>16</u>
5. <u>Betula nana</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
6. <u>Ledum decumbens</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	Column Totals: <u>124</u> (A) <u>372</u> (B)
Total Cover: <u>48</u>				<u>Prevalence Index = B/A=</u> <u>3.00</u>
50% of total cover: <u>24</u>				
20% of total cover: <u>9.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Equisetum arvense</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Petasites frigidus s.l.</u>	<u>4</u>	<u>No</u>	<u>FACW</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Carex microchaeta</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>76</u>				
50% of total cover: <u>38</u>				
20% of total cover: <u>15.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>10</u>				Present?
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-7									hor:Oe
7-9	10YR 4/2	100					N/A	Silt Loam	hor:A
9-20	10YR 4/6	94	2.5Y 5/2	6	D	PL	N/A	Sandy Clay Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:
☐ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:
☐ Alaska Color Change (TA4)⁴
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox With 2.5Y Hue

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

☐ Alaska Gleyed Without Hue 5Y or Redder
☐ Underlying Layer
☐ Other (Explain in Remarks)

Restrictive Layer (if present):
Type: _____
Depth (inches): _____
Field Drainage Class: MWD - Moderately Well Drained

Hydric Soil Present? Yes No ☒

Remarks: No indicators

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)
☐ Surface Water (A1)
☐ High Water Table (A2)
☐ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Marl Deposits (B15)
☐ Hydrogen Sulfide Odor (C1)
☐ Dry Season Water Table (C2)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)
☐ Water-stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ Microtopographic Relief (D4)
☐ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes No ☒ Depth (inches): _____
Water Table Present? Yes No ☒ Depth (inches): _____
Saturation Present? Yes No ☒ Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No water table or saturation

Geomorphic Position:

Additional Reference Data: Photos

HDR2223_18



Photo Name: Photo_180724075554



Photo Name: Photo_180724075503



Photo Name: Photo_180724075606

Additional Reference Data: Photos

HDR2223_18



Photo Name: Photo_180724075538



Photo Name: Photo_180724075550



Photo Name: Photo_180724075600

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/24/2018
 Applicant/Owner: PLP Sampling Point: HDR2224_18
 Investigators: MD MW Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): Concave Slope(%): 2 HGM: Slope
 Subregion (LRR): X Lat: 59.900589 Long: -155.270386 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1B

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Hummocks (DEST-H)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>4</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>80</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Betula nana</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Spiraea stevenii</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	FACW species <u>34</u> x2= <u>68</u>
3. <u>Rhododendron tomentosum</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	FAC species <u>65</u> x3= <u>195</u>
4. <u>Vaccinium uliginosum</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	FACU species <u>20</u> x4= <u>80</u>
5. <u>Salix fuscescens</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	UPL species <u> </u> x5= <u> </u>
6. <u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Column Totals: <u>119</u> (A) <u>343</u> (B)
Total Cover: <u>87</u>				<u>Prevalence Index = B/A=</u> <u>2.88</u>
50% of total cover: <u>43.5</u>				
20% of total cover: <u>17.4</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Rubus chamaemorus</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Carex bigelowii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Pedicularis labradorica</u>	<u>2</u>	<u>No</u>	<u>FACW</u>	<u> </u> data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>32</u>				
50% of total cover: <u>16</u>				
20% of total cover: <u>6.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>40</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>40</u>				Present?
(Where applicable)				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-17									hor:Oe
17-20	2.5 Y 4/2	90	10YR 4/3	10	C	M		Sandy Loam	hor:B1
20-28	2.5Y 4/2	100						Loamy Fine Sand	

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)		<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)		<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)		<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)		³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)		and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)		⁴ Give details of color change in Remarks.	

Restrictive Layer (if present):	
Type: _____	
Depth (inches): _____	
Field Drainage Class: SPD - Somewhat Poorly Drained	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 17.0	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 8.0	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2224_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Andromeda polifolia</u>	<u>2</u>	<u>No</u>	<u>FACW</u>

Additional Reference Data: Photos

HDR2224_18

Photo Name: Photo_180724083633



Photo Name: Photo_180724085047





Photo Name: Photo_180724083642



Photo Name: Photo_180724083648



Photo Name: Photo_180724085035

Photo Name: Photo_180724083638



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/24/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2225_18</u>	
Investigators: <u>MNW MD</u>	Landform (hillslope, terrace, etc.): <u>Swale</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>5</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.900585</u>	Long: <u>-155.269058</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Bluejoint Herb (BH)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation. upper part of small swale that drains to the east. No sign of flowing water.</u>	

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>67</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Spiraea stevenii</u>	12	Yes	FACU	OBL species <u> </u> x1= <u> </u>
2. <u>Salix arctica</u>	10	Yes	FAC	FACW species <u>2</u> x2= <u>4</u>
3. <u>Vaccinium uliginosum</u>	6	No	FAC	FAC species <u>97</u> x3= <u>291</u>
4. <u>Empetrum nigrum</u>	4	No	FAC	FACU species <u>22</u> x4= <u>88</u>
5. <u>Salix pulchra</u>	2	No	FAC	UPL species <u> </u> x5= <u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u>121</u> (A) <u>383</u> (B)
Total Cover: <u>34</u>				<u>Prevalence Index = B/A=</u> <u>3.17</u>
50% of total cover: <u>17</u>				
20% of total cover: <u>6.8</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	70	Yes	FAC	<u>X</u> Dominance Test is >50%
2. <u>Carex brunnescens</u>	5	No	FAC	<u> </u> Prevalence Index is ≤3.0
3. <u>Gymnocarpium dryopteris</u>	4	No	FACU	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Trientalis europaea</u>	4	No	FACU	<u> </u> data in Remarks or on a separate sheet)
5. <u>Epilobium angustifolium</u>	2	No	FACU	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Sanguisorba canadensis</u>	2	No	FACW	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>87</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
50% of total cover: <u>43.5</u>				
20% of total cover: <u>17.4</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes <u>10</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-5									hor:Oe
5-7									hor:Oa
7-20	10YR 4/2	40					N/A	Silt Loam	hor:B
7-20	10YR4/3	60					N/A	Silt Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: WD - Well Drained	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X
---	---

Remarks: No indicators

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Microtopographic Relief (D4)
	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No saturation or water table observed

Geomorphic Position:



Photo Name: Photo_180724092517



Photo Name: Photo_180724092528



Photo Name: Photo_180724092454

Additional Reference Data: Photos

HDR2225_18



Photo Name: Photo_180724092444



Photo Name: Photo_180724092521



Photo Name: Photo_180724092532

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/24/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2227_18</u>	
Investigators: <u>MNW MD</u>	Landform (hillslope, terrace, etc.): <u>Hillslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): <u>4</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.902569</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>U</u>	

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Carex (DEST-C)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>	Hydric Soil Present? Yes <u> </u> No <u>X</u>
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>6</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>83</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	30	Yes	FAC	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Ledum decumbens</u>	20	Yes	FAC	OBL species <u> </u> x1= <u> </u>
3. <u>Spiraea beauverdiana</u>	20	Yes	FACU	FACW species <u>10</u> x2= <u>20</u>
4. <u>Betula nana</u>	10	No	FAC	FAC species <u>120</u> x3= <u>360</u>
5. <u>Vaccinium uliginosum</u>	10	No	FAC	FACU species <u>28</u> x4= <u>112</u>
6. <u>Salix pulchra</u>	5	No	FAC	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>108</u>				Column Totals: <u>158</u> (A) <u>492</u> (B)
50% of total cover: <u>54</u>				<u>Prevalence Index = B/A=</u> <u>3.11</u>
20% of total cover: <u>21.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	15	Yes	FAC	<u>X</u> Dominance Test is >50%
2. <u>Carex microchaeta</u>	15	Yes	FAC	<u> </u> Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	10	Yes	FAC	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Epilobium angustifolium</u>	5	No	FACU	<u> </u> data in Remarks or on a separate sheet)
5. <u>Rubus chamaemorus</u>	5	No	FACW	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>50</u>				
50% of total cover: <u>25</u>				
20% of total cover: <u>10</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes <u>20</u>				
(Where applicable)				
Remarks: <u>5% lichen</u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-4	10YR 3/2	100						Silt Loam	hor:A
4-8	10YR 3/3	100						Fine Sandy Loam	hor:B
8-10	7.5YR 3/1	100						Fine Sandy Loam	hor:B1
10-20	10YR 3/3	100						Sandy Loam	hor:B2
20-24	2.5Y 4/3	70	7.5 YR 4/5	30	C	PL		Sandy Loam	hor:B

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.	

Restrictive Layer (if present):	
Type: _____	
Depth (inches): _____	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Field Drainage Class: WD - Well Drained	

Remarks: no indicators

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
(includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary hydro indicators present.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2227_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
Vaccinium vitis-idaea	5	No	FAC
Salix fuscescens	5	No	FACW
Picea glauca	3	No	FACU

Additional Reference Data: Photos

HDR2227_18



Photo Name: Photo_180724102740



Photo Name: Photo_180724102708



Photo Name: Photo_180724102735



Photo Name: Photo_180724102748



Photo Name: Photo_180724102729

Additional Reference Data: Photos

HDR2227_18

Photo Name: Photo_180724102712



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/24/2018
 Applicant/Owner: PLP Sampling Point: HDR2229_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Hillslope
 Local Relief (concave, convex, none): Concave Slope(%): 4 HGM: Slope
 Subregion (LRR): X Lat: 59.903519 Long: -155.270828 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1B

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Carex (DEST-C)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover:	<u> </u>			
50% of total cover:	<u>0</u>	20% of total cover:	<u>0</u>	
Sapling/Shrub Stratum				Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: OBL species <u> </u> x1= <u> </u> FACW species <u>12</u> x2= <u>24</u> FAC species <u>162</u> x3= <u>486</u> FACU species <u>1</u> x4= <u>4</u> UPL species <u> </u> x5= <u> </u> Column Totals: <u>175</u> (A) <u>514</u> (B) Prevalence Index = B/A= <u>2.94</u>
1. <u>Empetrum nigrum</u>	<u>65</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Ledum decumbens</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Vaccinium uliginosum</u>	<u>20</u>	<u>No</u>	<u>FAC</u>	
4. <u>Salix pulchra</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
5. <u>Vaccinium vitis-idaea</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
6. <u>Betula nana</u>	<u>4</u>	<u>No</u>	<u>FAC</u>	
Total Cover:	<u>139</u>			
50% of total cover:	<u>69.5</u>	20% of total cover:	<u>27.8</u>	
Herb Stratum				Hydrophytic Vegetation Indicators: X Dominance Test is >50% X Prevalence Index is ≤3.0 Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
1. <u>Carex bigelowii</u>	<u>16</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Rubus chamaemorus</u>	<u>8</u>	<u>Yes</u>	<u>FACW</u>	
3. <u>Carex microchaeta</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
4. <u>Petasites frigidus s.l.</u>	<u>4</u>	<u>No</u>	<u>FACW</u>	
5. <u>Equisetum arvense</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
6. <u>Polygonum bistorta ssp. plumosum</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover:	<u>36</u>			
50% of total cover:	<u>18</u>	20% of total cover:	<u>7.2</u>	
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>50</u> % Cover of Bryophytes <u>70</u> (Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-8									hor:Oe
8-10	10YR 4/2	100					No	Silt Loam	hor:B
10-12	7.5YR 4/2	100						Sandy Loam	hor:B1
12-20	10YR 3/2						No	Sandy Loam	hor:B2 80% gravel

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: _____		
Depth (inches): _____		
Field Drainage Class: SPD - Somewhat Poorly Drained		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 9.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 5.0		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2229_18



Photo Name: Photo_180724112749



Photo Name: Photo_180724112803



Photo Name: Photo_180724112758



Photo Name: Photo_180724112754



Photo Name: Photo_180724112723



Photo Name: Photo_180724112731

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/24/2018
 Applicant/Owner: PLP Sampling Point: HDR2230_18
 Investigators: MW MD Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): Concave Slope(%): 3 HGM: N/A
 Subregion (LRR): X Lat: 59.904137 Long: -155.270859 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Dwarf Ericaceous Shrub Tundra (DEST)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>6</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>83</u> (A/B)
20% of total cover: <u>0</u>				Prevalence Index worksheet:
<u>Sapling/Shrub Stratum</u>				<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
1. <u>Empetrum nigrum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
2. <u>Betula nana</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u> </u> x2= <u> </u>
3. <u>Spiraea beauverdiana</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	FAC species <u>75</u> x3= <u>225</u>
4. <u>Ledum decumbens</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FACU species <u>15</u> x4= <u>60</u>
5. <u>Vaccinium uliginosum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	UPL species <u> </u> x5= <u> </u>
6. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Column Totals: <u>90</u> (A) <u>285</u> (B)
Total Cover: <u>80</u>				<u>Prevalence Index = B/A=</u> <u>3.17</u>
50% of total cover: <u>40</u>				
20% of total cover: <u>16</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex microchaeta</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Calamagrostis canadensis</u>	<u>3</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Prevalence Index is ≤3.0
3. <u>Equisetum sylvaticum</u>	<u>2</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>10</u>				
50% of total cover: <u>5</u>				
20% of total cover: <u>2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				Hydrophytic
% Bare Ground <u>0</u>				Vegetation
% Cover of Wetland Bryophytes <u>0</u>				Yes <u>X</u> No <u> </u>
% Cover of Bryophytes <u>40</u>				Present?
(Where applicable)				

Remarks: Lichen 20%

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oe
2-8	10YR 2/2	100						Silt Loam	hor:A
8-20	7.5YR 2.5/3:	100						Sandy Loam	hor:B1
20-24	7.5YR 3/3	100						Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)		<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)		<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)		<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)		³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,	
<input type="checkbox"/> Alaska Redox (A14)		and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)		⁴ Give details of color change in Remarks.	

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: _____					
Depth (inches): _____					
Field Drainage Class: WD - Well Drained					

Remarks: No indicators

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	No	X
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches): _____				
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches): _____				
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches): _____				
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No indicators

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2230_18

	Absolute % Cover	Dominant Species?	Indicator Status
Sapling/Shrub			
<u>Vaccinium vitis-idaea</u>	<u>5</u>	<u>No</u>	<u>FAC</u>

Additional Reference Data: Photos

HDR2230_18



Photo Name: Photo_180724123144



Photo Name: Photo_180724123139

Additional Reference Data: Photos

HDR2230_18



Photo Name: Photo_180724123338



Photo Name: Photo_180724123302



Photo Name: Photo_180724123133



Photo Name: Photo_180724123151

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/24/2018
 Applicant/Owner: PLP Sampling Point: HDR2231_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Shoulder Slope
 Local Relief (concave, convex, none): None Slope(%): 1 HGM: Slope
 Subregion (LRR): X Lat: 59.908756 Long: -155.266403 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1B

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Carex (DEST-C)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>		

Remarks: Wetter than normal antecedent precipitation

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	60	Yes	FAC	<u>Total % Cover of:</u> <u>15</u> <u>Multiply by:</u> <u>15</u>
2. <u>Betula nana</u>	20	Yes	FAC	OBL species <u>15</u> x1= <u>15</u>
3. <u>Vaccinium uliginosum</u>	20	Yes	FAC	FACW species <u>30</u> x2= <u>60</u>
4. <u>Rhododendron tomentosum</u>	15	No	FAC	FAC species <u>145</u> x3= <u>435</u>
5. <u>Salix arctica</u>	10	No	FAC	FACU species <u>1</u> x4= <u>4</u>
6. <u>Vaccinium vitis-idaea</u>	5	No	FAC	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>130</u>				Column Totals: <u>191</u> (A) <u>514</u> (B)
50% of total cover: <u>65</u>				<u>Prevalence Index = B/A =</u> <u>2.69</u>
20% of total cover: <u>26</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Rubus chamaemorus</u>	30	Yes	FACW	<u>X</u> Dominance Test is >50%
2. <u>Carex aquatilis</u>	15	Yes	OBL	<u>X</u> Prevalence Index is ≤3.0
3. <u>Carex bigelowii</u>	10	No	FAC	<u> </u> Morphological Adaptations ¹ (Provide
4. <u>Calamagrostis canadensis</u>	5	No	FAC	data in Remarks or on a separate sheet)
5. <u>Trientalis europaea</u>	1	No	FACU	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>61</u>				
50% of total cover: <u>30.5</u>				
20% of total cover: <u>12.2</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>50</u>				
% Cover of Bryophytes <u>70</u>				
(Where applicable)				

Remarks: Lichen 20% cover

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-8									hor:Oe
8-10									hor:Oa
10-14									hor:Oe
14-19	10YR 5/2	90	7.5YR 4/3	10	C	M	N/A	Silty Clay Loam	hor:B1
19-21	7.5YR 5/4	100						Clay Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	PD - Poorly Drained				

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):				
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X Depth (inches):				
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> X Depth (inches): 8.0				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Saturation within the organic layer slow and may indicate water table depth over time, but not visible during field review.

Geomorphic Position:



Photo Name: Photo_180724131652



Photo Name: Photo_180724131646



Photo Name: Photo_180724131551

Additional Reference Data: Photos

HDR2231_18



Photo Name: Photo_180724131656



Photo Name: Photo_180724131700



Photo Name: Photo_180724131619

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/24/2018
 Applicant/Owner: PLP Sampling Point: HDR2233_18
 Investigators: MW MD Landform (hillslope, terrace, etc.): Toeslope
 Local Relief (concave, convex, none): Concave Slope(%): 4 HGM: Slope
 Subregion (LRR): X Lat: 59.908764 Long: -155.267059 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: PSS1B

Vegetation Type: Dwarf Ericaceous Shrub Tundra – Carex (DEST-C)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Wetter than normal antecedent precipitation</u>					

VEGETATION – Use scientific names of plants. List all species in the plot.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>5</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>5</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Empetrum nigrum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
2. <u>Ledum decumbens</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u> </u> x1= <u> </u>
3. <u>Vaccinium uliginosum</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>23</u> x2= <u>46</u>
4. <u>Betula nana</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	FAC species <u>113</u> x3= <u>339</u>
5. <u>Salix fuscescens</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	FACU species <u> </u> x4= <u> </u>
6. <u>Andromeda polifolia</u>	<u>3</u>	<u>No</u>	<u>FACW</u>	UPL species <u> </u> x5= <u> </u>
Total Cover: <u>78</u>				Column Totals: <u>136</u> (A) <u>385</u> (B)
50% of total cover: <u>39</u>				<u>Prevalence Index = B/A=</u> <u>2.83</u>
20% of total cover: <u>15.6</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex bigelowii</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Rubus chamaemorus</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Vaccinium vitis-idaea</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	<u> </u> Morphological Adaptations ¹ (Provide
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	must be present, unless disturbed or problematic.
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Total Cover: <u>58</u>				Hydrophytic Vegetation Present?
50% of total cover: <u>29</u>				
20% of total cover: <u>11.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u>		% Cover of Bryophytes <u>20</u>		Yes <u>X</u> No <u> </u>
(Where applicable)				
Remarks: <u> </u>				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4									hor:Oi
4-22									hor:Oe

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input checked="" type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	<input checked="" type="checkbox"/> X	No
Type:					
Depth (inches):					
Field Drainage Class:	PD - Poorly Drained				

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X				
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic Position:

Additional Reference Data: Photos

HDR2233_18



Photo Name: Photo_180724140629



Photo Name: Photo_180724140703



Photo Name: Photo_180724140708

Additional Reference Data: Photos

HDR2233_18



Photo Name: Photo_180724140653



Photo Name: Photo_180724140658



Photo Name: Photo_180724140618

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Pebble 2018 Borough/City: Lake and Peninsula Sampling Date: 7/24/2018
 Applicant/Owner: PLP Sampling Point: HDR2234_18
 Investigators: MNW MD Landform (hillslope, terrace, etc.): Valleybottom
 Local Relief (concave, convex, none): None Slope(%): 3 HGM: N/A
 Subregion (LRR): X Lat: 59.908485 Long: -155.269196 Datum: WGS84
 Soil Map Unit Name: N/A NWI Classification: U

Vegetation Type: Mesic Herb (MH)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)
 Are Vegetation: Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation: Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: <u>Wetter than normal antecedent precipitation</u>			

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	That Are OBL, FACW, or FAC: <u>3</u> (A)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Species Across All Strata: <u>3</u> (B)
Total Cover: <u> </u>				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
Total Cover: <u>15</u>				
50% of total cover: <u>7.5</u>				
20% of total cover: <u>3</u>				
Total Cover: <u>185</u>				
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Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-2									hor:Oi
2-6									hor:Oe
6-12	7.5YR4/3	100					No	Fine Sandy Loam	hor:B1
12-21	10YR4/2	90	7.5YR 4/6	10	C			Fine Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:
☐ Histosol or Histel (A1)
☐ Histic Epipedon (A2)
☐ Hydrogen Sulfide (A4)
☐ Thick Dark Surface (A12)
☐ Alaska Gleyed (A13)
☐ Alaska Redox (A14)
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils³:
☐ Alaska Color Change (TA4)⁴
☐ Alaska Alpine Swales (TA5)
☐ Alaska Redox With 2.5Y Hue

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

⁴Give details of color change in Remarks.

☐ Alaska Gleyed Without Hue 5Y or Redder
☐ Underlying Layer
☐ Other (Explain in Remarks)

Restrictive Layer (if present):
Type: _____
Depth (inches): _____
Field Drainage Class: SPD - Somewhat Poorly Drained

Hydric Soil Present? Yes No ☒ X

Remarks: No indicators

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)
☐ Surface Water (A1)
☐ High Water Table (A2)
☐ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Marl Deposits (B15)
☐ Hydrogen Sulfide Odor (C1)
☐ Dry Season Water Table (C2)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)
☐ Water-stained Leaves (B9)
☐ Drainage Patterns (B10)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Salt Deposits (C5)
☐ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ Microtopographic Relief (D4)
☒ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes No ☒ X Depth (inches): _____
Water Table Present? Yes No ☒ X Depth (inches): _____
Saturation Present? Yes No ☒ X Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes No ☒ X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Plot on terrace near stream but 3' above the stream water level. Does not flood the area. Spring fed creek with moss growing down to water level. Some water observed in the upper 4 inches and this suspected due to recent rains

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2234_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Cornus suecica	2	No	FAC
Festuca altaica	2	No	FAC
Fritillaria camschatcensis	2	No	FAC
Iris setosa	2	No	FAC
Sedum rosea ssp. integrifolium	2	No	FAC
Epilobium anqustifolium	2	No	FACU
Lupinus nootkatensis	2	No	FACU
Pyrola asarifolia	2	No	FACU
Viola lanqsdorffii	2	No	FACW
Carex rostrata	2	No	OBL
Luzula multiflora	1	No	FACU

Additional Reference Data: Photos

HDR2234_18



Photo Name: Photo_180724143440



Photo Name: Photo_180724143428

Additional Reference Data: Photos

HDR2234_18



Photo Name: Photo_180724143409



Photo Name: Photo_180724143433



Photo Name: Photo_180724143352

Photo Name: Photo_180724143343



WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>7/24/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR2236_18</u>	
Investigators: <u>MW MD</u>	Landform (hillslope, terrace, etc.): <u>Toeslope</u>	
Local Relief (concave, convex, none): <u>Concave</u>	Slope(%): <u>2</u>	HGM: <u>N/A</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.921623</u>	Long: <u>-155.317520</u>
Soil Map Unit Name: <u>N/A</u>	Datum: <u>WGS84</u>	
Vegetation Type: <u>Dwarf Ericaceous Shrub Tundra (DEST)</u>		NWI Classification: <u>U</u>

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If No, explain in Remarks)

Are Vegetation: ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation: ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Remarks: <u>Wetter than normal antecedent precipitation</u>		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum				Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>10</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>11</u> (B)
4. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>91</u> (A/B)
Total Cover: _____				Prevalence Index worksheet:
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		<u>Total % Cover of:</u> <u> </u> <u>Multiply by:</u> <u> </u>
Sapling/Shrub Stratum				OBL species <u> </u> x1= <u> </u>
1. <u>Empetrum nigrum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	FACW species <u>5</u> x2= <u>10</u>
2. <u>Betula nana</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	FAC species <u>139</u> x3= <u>417</u>
3. <u>Salix arctica</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	FACU species <u>13</u> x4= <u>52</u>
4. <u>Salix reticulata</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	UPL species <u>6</u> x5= <u>30</u>
5. <u>Vaccinium uliginosum</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Column Totals: <u>163</u> (A) <u>509</u> (B)
6. <u>Salix pulchra</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
Total Cover: <u>91</u>				<u>Prevalence Index = B/A=</u> <u>3.12</u>
50% of total cover: <u>45.5</u>		20% of total cover: <u>18.2</u>		Hydrophytic Vegetation Indicators:
Herb Stratum				<input checked="" type="checkbox"/> Dominance Test is >50%
1. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<input type="checkbox"/> Prevalence Index is ≤3.0
2. <u>Carex bigelowii</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	<input type="checkbox"/> Morphological Adaptations ¹ (Provide data in Remarks or on a separate sheet)
3. <u>Festuca altaica</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
4. <u>Rubus arcticus s.l.</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
5. <u>Epilobium angustifolium</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	
6. <u>Erigeron peregrinus</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>	
7. <u>Cornus suecica</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
8. <u>Pyrola grandiflora</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
9. <u>Sedum rosea ssp. integrifolium</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
10. <u>Anemone narcissiflora</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
Total Cover: <u>72</u>				
50% of total cover: <u>36</u>		20% of total cover: <u>14.4</u>		
Plot size (radius, or length x width) <u>1/10 acre</u>		% Bare Ground <u>0</u>		Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
% Cover of Wetland Bryophytes <u>0</u> (Where applicable)		% Cover of Bryophytes <u>25</u>		
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-3									hor:Oi
3-7									hor:Oe
7-17	10YR 3/2	100						Sandy Loam	hor:B1
17-22	10YR 3/3	100						Sandy Loam	hor:B2

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	⁴ Give details of color change in Remarks.		

Restrictive Layer (if present): Type: _____ Depth (inches): _____ Field Drainage Class: WD - Well Drained	Hydric Soil Present? Yes _____ No _____ X _____
---	--

Remarks: No indicators. Some cobbles and gravels in mineral horizons.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes _____ No _____ X _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ X _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ X _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____ X _____
---	--

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydro indicators present

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR2236_18

	Absolute % Cover	Dominant Species?	Indicator Status
Herb			
Linnaea borealis	3	No	FACU
Artemisia arctica	3	No	NL
Poa arctica	2	No	FAC
Angelica lucida	2	No	FACU
Sapling/Shrub			
Vaccinium vitis-idaea	3	No	FAC
Arctostaphylos uva-ursi	3	No	UPL

Additional Reference Data: Photos

HDR2236_18



Photo Name: Photo_180724154617



Photo Name: Photo_180724154628

Additional Reference Data: Photos

HDR2236_18



Photo Name: Photo_180724154605



Photo Name: Photo_180724154611



Photo Name: Photo_180724154559



Photo Name: Photo_180724154622

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	6/19/2018
Applicant/Owner:	PLP			Sampling Point:	HDR3000_18
Investigators:	MS MD	Landform (hillslope, terrace, etc.):	Footslope		
Local Relief (concave, convex, none):	None	Slope(%):	8	HGM:	N/A
Subregion (LRR):	X	Lat:	59.888340	Long:	-155.438690
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	U		

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			

Tree Stratum		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:			
1.					Number of Dominant Species			
2.					That Are OBL, FACW, or FAC: 2 (A)			
3.					Total Number of Dominant			
4.					Species Across All Strata: 2 (B)			
Total Cover:					Percent of Dominant Species			
50% of total cover: 0					That Are OBL, FACW, or FAC: 100 (A/B)			
20% of total cover: 0								
Sapling/Shrub Stratum					Prevalence Index worksheet:			
1.	Empetrum nigrum	90	Yes	FAC	Total % Cover of:		Multiply by:	
2.	Salix pulchra	15	No	FAC	OBL species	x1=		
3.	Vaccinium uliginosum	8	No	FAC	FACW species	1 x2=	2	
4.	Betula nana	1	No	FAC	FAC species	121 x3=	363	
5.					FACU species	1 x4=	4	
6.					UPL species	x5=		
Total Cover: 114					Column Totals:	123 (A)	369 (B)	
50% of total cover: 57					20% of total cover: 22.8		Prevalence Index = B/A= 3.00	
Herb Stratum					Hydrophytic Vegetation Indicators:			
1.	Calamagrostis canadensis	5	Yes	FAC	X	Dominance Test is >50%		
2.	Carex bigelowii	1	No	FAC	X	Prevalence Index is ≤3.0		
3.	Rhodiola integrifolia	1	No	FAC	Morphological Adaptations ¹ (Provide			
4.	Geranium erianthum	1	No	FACU	data in Remarks or on a separate sheet)			
5.	Sanguisorba canadensis	1	No	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)			
6.								
7.								
8.								
9.								
10.								
Total Cover: 9								
50% of total cover: 4.5					20% of total cover: 1.8			
Plot size (radius, or length x width) 1/10 acre					% Bare Ground 0			
% Cover of Wetland Bryophytes None					% Cover of Bryophytes 55			
(Where applicable)								
					Hydrophytic Vegetation Present? Yes X No			

Remarks:
Lichen 1%.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-5							N/A	Organic	hor:Oi
5-8	10YR3/2	100					N/A	Silt Loam	hor:A
8-21	2.5Y3/3	100					No	Silt Loam	hor:B Gravels 30%

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: SPD - Somewhat Poorly Drained					

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	X	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	Depth (inches):			
Water Table Present?	Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):	13.0		
Saturation Present?	Yes <input type="checkbox"/> X No <input type="checkbox"/>	Depth (inches):	7.0		
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Saturation not typical, due to higher than normal precipitation.

Geomorphic Position:



Photo Name: Photo_180619093628



Photo Name: Photo_180619093618



Photo Name: Photo_180619093646



Photo Name: Photo_180619093731



Photo Name: Photo_180619093718



Photo Name: Photo_180619093636

WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: <u>Pebble 2018</u>	Borough/City: <u>Lake and Peninsula</u>	Sampling Date: <u>6/19/2018</u>
Applicant/Owner: <u>PLP</u>	Sampling Point: <u>HDR3001_18</u>	
Investigators: <u>MS MD</u>	Landform (hillslope, terrace, etc.): <u>Footslope</u>	
Local Relief (concave, convex, none): <u>None</u>	Slope(%): _____	HGM: <u>Slope</u>
Subregion (LRR): <u>X</u>	Lat: <u>59.887848</u>	Datum: <u>WGS84</u>
Soil Map Unit Name: <u>N/A</u>	NWI Classification: <u>PSS1B</u>	

Vegetation Type: Open Willow Low Shrub (OWLS)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If No, explain in Remarks)

Are Vegetation: _____ Soil _____ or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ X _____ No _____

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____		
Wetland Hydrology Present? Yes <u>X</u> No _____		
Remarks: <u>OWLS. HGM Slope. Wetter than normal antecedent precipitation. Valley.</u>		

VEGETATION – Use scientific names of plants. List all species in the plot. *See Vegetation Overflow for more

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species
2. _____	_____	_____	_____	That Are OBL, FACW, or FAC: <u>2</u> (A)
3. _____	_____	_____	_____	Total Number of Dominant
4. _____	_____	_____	_____	Species Across All Strata: <u>2</u> (B)
Total Cover: _____				Percent of Dominant Species
50% of total cover: <u>0</u>				That Are OBL, FACW, or FAC: <u>100</u> (A/B)
20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Salix pulchra</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	<u>Total % Cover of:</u> _____ <u>Multiply by:</u> _____
2. _____	_____	_____	_____	OBL species _____ x1= _____
3. _____	_____	_____	_____	FACW species <u>12</u> x2= <u>24</u>
4. _____	_____	_____	_____	FAC species <u>123</u> x3= <u>369</u>
5. _____	_____	_____	_____	FACU species <u>3</u> x4= <u>12</u>
6. _____	_____	_____	_____	UPL species _____ x5= _____
Total Cover: <u>50</u>				Column Totals: <u>138</u> (A) <u>405</u> (B)
50% of total cover: <u>25</u>				<u>Prevalence Index = B/A=</u> <u>2.93</u>
20% of total cover: <u>10</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>45</u>	<u>Yes</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Anemone richardsonii</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	Morphological Adaptations ¹ (Provide
4. <u>Carex bigelowii</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	data in Remarks or on a separate sheet)
5. <u>Equisetum arvense</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation ¹ (Explain)
6. <u>Veratrum viride</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	
7. <u>Epilobium angustifolium</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology
8. <u>Valeriana capitata</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	must be present, unless disturbed or problematic.
9. <u>Angelica lucida</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
10. <u>Angelica genuflexa</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
Total Cover: <u>88</u>				
50% of total cover: <u>44</u>				
20% of total cover: <u>17.6</u>				
Plot size (radius, or length x width) <u>1/10 acre</u>				
% Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u>				
% Cover of Bryophytes <u>40</u>				
(Where applicable)				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-9							N/A	Organic	hor:Oi
9-15	2.5Y3/2	100					No	Loam	hor:A 15% gravels
15-21	10YR2/2	100					No	Sandy Loam	hor:B/C 30% Gravels, 30% Coarse Sand

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input checked="" type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: None		
Depth (inches):		
Field Drainage Class: SPD - Somewhat Poorly Drained		

Remarks: Likely has variable water table throughout the year.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 1.0		
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 3.0		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0.0		
(includes capillary fringe)		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No stream through polygon. Game trail with standing water bisects polygon perpendicular to the slope.

Geomorphic Position:

Additional Reference Data: Overflow Vegetation

HDR3001_18

Herb	Absolute % Cover	Dominant Species?	Indicator Status
Viola langsdorffii	1	No	FACW

Additional Reference Data: Photos

HDR3001_18



Photo Name: Photo_180619114610



Photo Name: Photo_180619114551

Additional Reference Data: Photos

HDR3001_18



Photo Name: Photo_180619114631



Photo Name: Photo_180619114557



Photo Name: Photo_180619114536



Photo Name: Photo_180619114544

Project/Site:	Pebble 2018	Borough/City:	Lake and Peninsula	Sampling Date:	6/19/2018
Applicant/Owner:	PLP			Sampling Point:	HDR3003_18
Investigators:	MS MD	Landform (hillslope, terrace, etc.):	Footslope		
Local Relief (concave, convex, none):	None	Slope(%):	3	HGM:	N/A
Subregion (LRR):	X	Lat:	59.886936	Long:	-155.438919
				Datum:	WGS84
Soil Map Unit Name:	N/A	NWI Classification:	U		

Are Vegetation: _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			

Tree Stratum		Absolute % Cover	Dominant Species?	Indicator Status
1.				
2.				
3.				
4.				
Total Cover:				
50% of total cover:		0	20% of total cover:	0
Sapling/Shrub Stratum				
1.	Salix pulchra	25	Yes	FAC
2.				
3.				
4.				
5.				
6.				
Total Cover:		25		
50% of total cover:		12.5	20% of total cover:	5
Herb Stratum				
1.	Calamagrostis canadensis	65	Yes	FAC
2.	Geranium erianthum	10	No	FACU
3.	Sanguisorba canadensis	10	No	FACW
4.	Festuca altaica	5	No	FAC
5.	Epilobium angustifolium	5	No	FACU
6.	Artemisia arctica	5	No	NL
7.	Rubus stellatus	3	No	FAC
8.	Angelica lucida	2	No	FACU
9.	Heracleum maximum	2	No	FACU
10.	Anemone narcissiflora	1	No	FACU
Total Cover:		108		
50% of total cover:		54	20% of total cover:	21.6
Plot size (radius, or length x width)		1/10 acre	% Bare Ground	0
% Cover of Wetland Bryophytes		% Cover of Bryophytes 65		
(Where applicable)				

Dominance Test Worksheet:

Number of Dominant Species

That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1=
FACW species	10 x2= 20
FAC species	98 x3= 294
FACU species	20 x4= 80
UPL species	5 x5= 25
Column Totals:	133 (A) 419 (B)

Prevalence Index = B/A= 3.15

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is ≤3.0

Morphological Adaptations¹ (Provide data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present?

Yes X No

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				α-α	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-4							N/A	Organic	hor:Oi
4-10	10YR3/2	100					No	Silt Loam	hor:A
10-25	7.5YR4/4	100					No	Sandy Loam	hor:B 30% Gravels

¹Type: C= Concentration, D= Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC = Root Channel

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol or Histel (A1)			<input type="checkbox"/> Alaska Color Change (TA4) ⁴		<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Alaska Alpine Swales (TA5)		<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Alaska Redox With 2.5Y Hue		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)					
<input type="checkbox"/> Alaska Gleyed (A13)			³ One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)			and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)			⁴ Give details of color change in Remarks.		

Restrictive Layer (if present):		Hydric Soil Present?	Yes	No	X
Type: None					
Depth (inches):					
Field Drainage Class: MWD - Moderately Well Drained					

Remarks: Underlying gravels and cobbles drain rapidly.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)		<input type="checkbox"/> Water-stained Leaves (B9)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present?	Yes	X	No
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): 3.0				
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): 20.0				
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (includes capillary fringe)	Depth (inches): 16.0				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Heavy recent rainfall.

Geomorphic Position:



Photo Name: Photo_180619132512



Photo Name: Photo_180619132536



Photo Name: Photo_180619132621



Photo Name: Photo_180619132523



Photo Name: Photo_180619132528



Photo Name: Photo_180619132550