K2.0 ALTERNATIVES

K2.1 ALTERNATIVE 1A

K2.1.1 Alternative 1a Project Components Footprints

Table K2-1 provides a summary of the Alternative 1a project footprint for each of the four project components (mine site, transportation corridor, port, and natural gas pipeline) described in Chapter 2, Alternatives, of the Environmental Impact Statement (EIS).

Project Component	Facility	Permanent Footprint (acres)	Temporary Construction Footprint (acres) ¹	Length (miles)
	Open Pit	609		
	Sediment/Seepage Collection Systems	360		
	Bulk Tailings Storage Facility	2,797		
	Pyritic Tailings Storage Facility	1,000		
	Stockpiles	527		
	Quarries ²	860		
Mino Sito	On-site Access Roads	860		39
Mille Sile	Mineral Processing Facilities	113		
	Mill Site Power Plant	22		
	Mine Site Infrastructure	139		
	Water Management Ponds	1,066		
	Waste Management Facilities	17		
	Water Treatment Plants	19	<1	
	Mine Site Total	8,390	<1	39
	Iliamna Spur Road			
	Explosive Storage Spur Road	4	2	<1
	Mine Access Road	353	290	35
	Kokhanok Spur Road	15	10	1
	Pedro Bay Airport Spur Road			
	Port Access Road	411	288	37
Transportation	North Access Road			
Corridor	Water Extraction Pads and Access Roads	<1	1	<1
Comuci	Material Sites	380		
	North Ferry Terminal			
	South Ferry Terminal	23	5	
	Kokhanok East Ferry Terminal			
	Eagle Bay Ferry Terminal	7	2	
	Pile Bay Ferry Terminal			
	Transportation Corridor Total	1,194	599	74
	Amakdedori Port	17	7	
	Amakdedori Port Airstrip	6	4	<1
	Diamond Point Port			
Port	Diamond Point Port Dredging Area			
	Water Extraction Pads and Access Roads	1	<1	<1
	Lightering Location—Mooring Buoys and Anchors	<1		
	Port Total	24	12	<1
Natural Gas	Compressor Station Pad ³	2		<1
Pipeline	HDD Pullback Work Area		<1	

 Table K2-1: Alternative 1a Project Footprint

Project Component	Facility	Permanent Footprint (acres)	Temporary Construction Footprint (acres) ¹	Length (miles)
	Onshore Pipeline-Only Pipeline Corridor Segments		219	13
	Material Sites			
	Pipeline Construction Access Roads			
	Cook Inlet Segment		628	104
	Cottonwood Bay Segment			
	Iliamna Lake Segment	1	156	21
	Natural Gas Pipeline Total	3	1,004	193 ⁴
	Alternative 1a Total	9,611	1,615	

Table K2-1: Alternative 1a Project Footprint

Notes:

Footprints are based on project GIS database. Numbers are rounded to the nearest whole number; therefore, the sum of individual facilities may not match the totals listed for the overall component.

¹ The temporary construction footprint for the transportation corridor and port components includes a 30-foot buffer around the permanent footprint where temporary construction-related activities would occur; except for the water extraction site access roads, which include a 5-foot buffer. The temporary construction footprint for the onshore pipeline-only segments (i.e., not adjacent to an access road) of the natural gas pipeline component includes a 150-foot-wide impact corridor to account for pipeline trenching, side-casting, and equipment operation/travel. The temporary construction footprint for offshore segments of the natural gas pipeline (i.e., lliamna Lake and Cook Inlet) varies (up to 102 foot maximum), as outlined in PLP 2019c.

² Includes Quarry B and Quarry C; Quarry A is in the footprint of the bulk TSF.

³ Includes the tie-in to the compressor station.

⁴ Total length of pipeline. Includes lengths for segments that are co-located with the transportation corridor access road(s) that are not listed under the natural gas pipeline section of the table.

-- = not applicable

TSF = tailings storage facility

K2.1.2Summary of Project Phases

Table K2-2 presents a summary and schedule of the four project phases (construction, operations, closure, and post-closure) used to describe the project and assess impacts throughout the EIS.

Phase	Activity	Absolute Year (Y)	Construction Year (CY)	Operations Year (OY)	Closure Year (CY)
	Construction	Y1 – Y4	CY1 – CY4	-	-
Construction (4 years)	Commissioning activities	Y4	CY4 – occurs in parallel with final construction	-	-
(Pre-production mining/dewatering	Y3 – Y4	CY3-CY4 – occurs in parallel with construction	-	-
Operations (20 years)	Operations	Y5 – Y24	-	OY1 – OY20	
Closure (20 years) ¹	Reclamation and closure	Y25 – Y45	-	-	CLY1 - CLY20
Post-closure (long-term) ²	Monitoring	Y46 →	-	-	CLY21 →

Table K2-2: Summary of Project Phases

Notes

¹ Includes closures phases 1 and 2 (PLP 2019d).

² Includes closure phase 3 and post-closure phase 4 (PLP 2019d). The long-term post-closure phase is expected to last for centuries.

K2.1.3Applicant's Proposed Construction Schedule

Table K2-3 presents a high-level overview of the proposed construction schedule.

Construction Activity	Estimated Start	Estimated End			
Access Infrastructure	9				
Amakdedori port site capture (land by barge)	May Y1				
North and south ferry terminal site capture	June/July Y1				
Construct temporary access Amakdedori to Kokhanok	June Y1	September Y1			
Construct temporary access north ferry terminal to mine site	July Y1	November Y1			
Access road construction (south)	September Y1	July Y2			
Access road construction (north)	November Y1	October Y2			
Construct major bridges	June Y2	September Y2			
Amakdedori port and dock construction	September Y1	September Y2			
Construct south ferry terminal	June Y2	September Y2			
Construct north ferry terminal	June Y2	September Y2			
Access construction complete		October Y2			
Ferry vessel construction and launch	September Y2	September Y3			
Natural Gas Pipeline		·			
Pipeline construction along road segments	November Y1	October Y2			
Offshore equipment mobilization and staging of vessels/supplies	March Y2	May Y2			
Construction of shoreline transition (trenching/HDD drilled from shore and tied in)	May Y2	August Y2			
Cook Inlet sub-sea pipeline placement (trenching, pipe welding/ placement/testing, as-built survey)	June Y2	August Y2			
Offshore equipment demobilization	September Y2				
Anchor Point compressor station	June Y3	August Y3			
Iliamna Lake sub-lake placement	June Y3	July Y3			
Natural gas pipeline construction complete		September Y3			
Mine Site					
Site capture (establish construction infrastructure)	November Y1	August Y2			
Major site earthworks	September Y2	May Y4			
Mill and infrastructure construction	May Y3	October Y4			
Pit pre-production mining	September Y3	October Y4			
Commencement of operations	October Y4				

Table K2-3:	Proposed	Construction	Schedule
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Notes:

-- = not applicable HDD = horizontal directional drilling Y = Year Source: PLP 2020-RFI 162

K2.1.4 Mining Phases, Material Type, and Volumes

Table K2-4 summarizes the types and volumes of material proposed to be mined during preproduction and production mining.

Mining Period	Material Type	Quantity
Pre-production (during the	Overburden	22 million tons
construction phase)	Waste rock	11 million tons
	Overburden	38 million tons
Production (during the operations phase)	Mineralized material process plant fed	1,291 million tons
, , , , , , , , , , , , , , , , , , , ,	Waste rock	82 million tons

Table K2-4: Proposed Material to be Mined

Source: PLP 2019d

K2.1.5 Mining Supplies, Processing Reagents, and Material

Table K2-5 lists the average annual quantities of fuel, mining, milling, and miscellaneous consumables, as well as common mining supplies, processing reagents, and materials. Typical packaging for transportation is also provided.

Material/Supply/ Reagent	Use	Shipping/Preparation	Annual Consumption ¹
Diesel Fuel	Vehicles and blasting	Shipped in bulk to the port and transferred to storage tank. Transferred to 6,350-gallon ISO tank- containers to ship to the mine site and there transferred to storage tanks.	16 million gallons
Lubricants	Vehicles and equipment	Drums and totes in containers	1,000 tons
Ammonium nitrate prill	Blasting	Bulk container	17,500 tons
Primers, detonators, and detonating cord	Blasting	Specialized packaging as required, shipped in containers	112,000 Units
Blasting emulsion ingredients	Blasting	Specialized packaging as required, shipped in containers	8,000 tons
Packaged explosives	Blasting	Specialized packaging as required, shipped in containers.	Included in miscellaneous supplies.
Haulage truck and other tires	Vehicles	Bulk containers/break bulk	1,000 tons
Ground-engaging tools	Drilling and loading	Bulk containers	Included in miscellaneous supplies.
Calcium Oxide (quick lime)	pH modifier; depresses pyrite in the copper- molybdenum flotation process. pH modifier for water treatment	Calcium oxide pebbles (80%) shipped in specially adapted shipping containers. Pebbles would be crushed and mixed with water to form lime slurry at the lime plant.	135,000 tons

Table K2-5: Mine Site Supplies and Quantities

Material/Supply/ Reagent	Use	Shipping/Preparation	Annual Consumption ¹
Sodium Ethyl Xanthate	Copper collector; used in the rougher flotation circuit.	Pelletized reagent packaged in 1-ton bags and shipped in containers. Mixed with process water to form 20% solution and stored in collector storage tank. Mix and storage tanks vented externally with fans.	8,000 tons
Fuel Oil (Diesel)	Used in the flotation process.	Shipped in tanker trucks and stored in the main head tank in the copper- molybdenum concentrator area.	Included in diesel fuel total.
Sodium Hydrogen Sulfide (NaHS)	Copper depressant used in the copper-molybdenum separation processes.	Pelletized reagent packaged in 1-ton bags and shipped in containers. Mixed with process water to form 20% solution and stored in the sodium hydrogen sulfide storage tank.	4,000 tons
Carboxy Methyl Cellulose	Depressant; anionic polymer used to depress clay and related gangue material in the bulk cleaner flotation circuit.	Pelletized reagent packaged in 1-ton bags and shipped in containers. Mixed with process water in the agitated dispersant tank to form 20 percent solution and stored in dispersant storage tank.	1,000 tons
Methyl Isobutyl Carbinol	Frother; maintains air bubbles in the flotation circuits.	Shipped in 20-foot specialized ISO containers and stored in the frother storage tank.	4,000 tons
Depressant (Sodium Silicate)	Clay or silica gangue mineral depressant used in the copper-molybdenum separation process.	Pelletized reagent packaged in 1-ton bags and shipped in containers. Mixed with process water to form 20% solution and stored in the sodium silicate storage tank.	3,000 tons
Anionic Polyacrylamide	Thickener aid.	Pelletized reagent packaged in 1-ton bags and shipped in containers. Vendor package preparation system composed of a bag breaking enclosure to contain dust, dry flocculent metering, and a wet jet system to combine treated water with the powdered flocculent in an agitated tank for maturation. Prepared in small batches and transferred to a flocculent storage tank.	Included in miscellaneous supplies.
Polyacrilic Acid	Anti-scalant for the lime production process.	Liquid shipped in 35-cubic-foot specialized container tanks in protected rectangular framework.	Included in miscellaneous supplies.
Nitrogen	Nitrogen used in the molybdenum flotation circuit to depress copper sulfides.	Provided by a vendor-supplied pressure swing adsorption nitrogen plant. This equipment separates nitrogen from air for use in the mineral-process plant.	15,000 tons
Grinding Media	Steel balls for use in grinding mills	Bulk containers	55,000 tons

	Table	K2-5:	Mine	Site	Supplies	and	Quantities
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Material/Supply/ Reagent	Use	Shipping/Preparation	Annual Consumption ¹
Miscellaneous Supplies	Varies	Bulk containers/break bulk	30,000 tons
Hydrochloric Acid (HCl, 35% Liquid Solution)	pH modifier used in water treatment for co-precipitation, metal oxidation and post- neutralization if needed.	Bulk liquid shipped in specialized container tanks. Transferred to on-site storage tanks. Dosed with metering pumps.	17,500 tons
Ferric Chloride (FeCl ₃ , Dry Solid or 35% Liquid Solution)	Introduces ferric iron into solution for metals co- precipitation in water treatment.	Dry solid shipped in bulk dry chemical tanks, dissolved in water and dosed with metering pumps. Also available as a 35% liquid solution.	15,000 tons
Ferrous Chloride (FeCl₂, 30% Liquid Solution)	Acts as reducing agent and provides iron for co- precipitation of metals and metalloids in water treatment.	Bulk liquid shipped in specialized container tanks. Transferred to on-site storage tanks and dosed with metering pumps.	125 tons
Potassium Permanganate (KMnO₄, Dry Solid)	Oxidation of metals in water treatment.	Dry solid packaged in 1.5-ton supersacks and shipped in containers. Dissolved in water and dosed with metering pumps.	100 tons
Polymer (Dry Solid)	Enhances coagulation and settling of precipitated solids in water treatment	Dry solid packaged in 1.5-ton supersacks and shipped in containers. Dissolved in water and dosed with metering pumps.	100 tons
Sodium Hydrogen Sulfide (NaSH, Dry Solid)	Reducing agent used for precipitation of metal sulfides.	Dry solid packaged in 1.5-ton supersacks and shipped in containers. Dissolved in water and dosed with metering pumps.	300 tons
Antiscalant (Liquid)	Disperses scale forming precipitates in RO systems.	Shipped in totes and dosed with metering pumps.	50 tons
Membrane Clean- In-Place Acid Solution (Liquid)	Acid cleaning solution for ultrafiltration and RO membranes. Typically a proprietary mixture of citric acid and chelating agents.	Small quantities packaged in totes or drums and shipped in containers. Diluted in CIP tanks, and pumped through membranes.	Included in miscellaneous supplies.
Membrane Clean- In-Place Alkaline Solution (Liquid)	Alkaline cleaning solution for ultrafiltration and RO membranes. Typically a proprietary mixture of 50% sodium hydroxide, detergents, and additives.	Small quantities packaged in totes or drums and shipped in containers. Diluted in CIP tanks, and pumped through membranes.	Included in miscellaneous supplies.
Soda Ash (Na₂CO₃, Dry Solid)	Adds alkalinity to treated water as needed prior to discharge.	Dry solid packaged in bulk dry chemical tanks or 1.5-ton supersacks and shipped in containers. Dissolved in water and dosed with metering pumps.	450 tons

Table K2-5:	Mine S	ite Supr	olies and	Quantities
			mes una	Quantitios

Notes: ¹ Numbers as presented are approximate and have been averaged and rounded as appropriate for ease of reference. ISO = International Organization for Standardization RO = Reverse Osmosis

CIP = Clean-In-Place Source: PLP 2019-RFI 152

K2.1.6Material Sites

Construction materials would be excavated from borrow material sites along the transportation corridor roads. Table K2-6 provides information for material sites under the Alternative 1a, including the estimated quantities, size, type of material, use of material, and whether blasting is required. Figure K2-1 and Figure K2-2 show the location of material sites proposed for the Alternative 1a.

Site	Quantity (cubic yards)	Size (acres) ¹	Туре	Blasting Required (Yes/No)	Use
		Port Acce	ss Road		
MS-A01	600,000	9	Rock and gravel	Yes	Road, Pipeline
MS-A02	500,000	10	Rock and gravel	Yes	Road, Pipeline
MS-A03	400,000	20	Rock	Yes	Road, Pipeline
MS-A04	400,000	22	Rock	Yes	Road, Pipeline
MS-A05	700,000	20	Rock	Yes	Road, Pipeline
MS-A06	400,000	19	Rock	Yes	Road, Pipeline
MS-A07	500,000	20	Rock	Yes	Road, Pipeline
MS-A08	400,000	20	Rock	Yes	Road, Pipeline, Port
Mine Access Road					
MS-E06	400,000	28	Sand and gravel	Yes	Road, Pipeline
MS-E07	250,000	45	Gravel	No	Road, Pipeline
MS-E08	250,000	16	Gravel	No	Road, Pipeline
MS-E09	400,000	29	Gravel	No	Road, Pipeline
MS-E10	300,000	8	Gravel	No	Road, Pipeline
MS-E11	300,000	25	Gravel	No	Road, Pipeline
MS-E12	200,000	33	Gravel	No	Road, Pipeline
MS-E13	250,000	16	Gravel	No	Road, Pipeline
MS-E14	400,000	20	Gravel	No	Road, Pipeline
MS-T00	200,000	8	Gravel	No	Road, Pipeline
MS-T01	700,000	12	Rock and gravel	Yes	Road, Pipeline
Alternative 1a Total	7,550,000	380			

Table K2-6: Alternative 1a Material Site Quantities Estimates

Notes:

¹Represents area of permanent impacts. Numbers are approximate and rounded. Source: Project GIS database





K2.1.7Water Extraction Sites

Water extraction from sources along the transportation corridor would be necessary to support project construction and operations (Figure K2-1 and Figure K2-2). Table K2-7 provides information for water extraction sites under the Alternative 1a, including the waterbody type, use, years and season of use, and estimated extraction rate and volumes.

Water		Waterbody		Vooro of	Extraction	
Extraction Site	(Yes/No)	Туре	Use	Use	Rate (gpm)	Annual Volume (gal)
			Port Access Road			
WES-01	Yes	Stream	Construction	Life of mine	1,000	5M
WES-02	Yes	Stream	Construction and testing	3	500	3M
WES-03	Yes	Lake	Construction	Life of mine	500	1M
WES-04	Yes	Stream	Construction	3	500	2M
WES-05	Yes	Lake	Construction	Life of mine	500	1M
WES-06	Yes	Pond	Construction	3	500	1M
WES-07	Yes	Stream	Construction	Life of mine	500	1M
WES-08	Yes	Lake	Construction	3	500	1M
WES-09	Yes	Stream	Construction and testing	3	1,000	1M
WES-10	Yes	Lake	Construction and testing	Life of mine	1,000	8M
			Mine Site Access Road			
WES-16	Yes	Stream	Construction and testing	Life of mine	500	1M
WES-17	Yes	Pond	Construction	3	500	1M
WES-18	Yes	Pond	Construction	3	500	1M
WES-E33	Yes	Lake	Road and pipeline construction	Life of mine	1,000	8M
WES-E34	Yes	Stream	Road and pipeline construction	3	500	3M
WES-N27	No	Stream	Road and pipeline construction	3	500	3M
WES-N28	Yes	Lake	Road and pipeline construction	3	500	3M
WES-N29	Yes	River	Road and pipeline construction	3	1,000	8M
WES-N30	Yes	River	Road and pipeline construction	Life of mine	1,000	5M
WES-N31	No	Stream	Road and pipeline construction	3	500	3M
WES-N32	Yes	Pond	Road and pipeline construction	3	500	3M
			Natural Gas Pipeline ¹			
WES-21	Yes	Stream	Construction and testing	Life of mine	500	1M
Alternative 1a Total 64						

 Table K2-7: Alternative 1a Water Extraction Site Quantity Estimates

Notes:

¹ Includes water extraction sites along pipeline-only portions of the natural gas pipeline corridor (i.e., not adjacent to transportation corridor access roads).

gal = gallons gpm = gallons per minute

M = million

Source: Project GIS database

K2.1.8Access Roads to Water Extraction Sites

All-season gravel roads would be necessary to access some of the water extraction sites proposed for the Alternative 1a (Figure K2-1 and Figure K2-2). Table K2-8 provides details on the location and approximate length and acreage of each planned access road.

Name	Nearest Milepost	Length (miles)	Permanent Footprint (acres) ¹	Temporary Construction Footprint (acres)
AWES-01	PAR MP-0	<1	1	<1
AWES-03	PAR MP-8	<1	<1	<1
AWES-05	PAR MP-15	<1	<1	<1
AWES-06	PAR MP-20	<1		<1
AWES-08	PAR MP-26	<1		<1
AWES-N28	MAR MP-11	<1		<1
AWES-N32	MAR MP-24	<1		<1
Alternative 1a Total		<1	1	1

Table K2-8: Alternative 1a Water Extraction Site Access Roads

Notes:

¹ Represents area of permanent impacts. Numbers are approximate and rounded.

< = less than

-- = not applicable

Source: Project GIS database.

K2.2 ALTERNATIVE 1

K2.2.1 Alternative 1 Project Components Footprints

Table K2-9 provides a summary of the Alternative 1 project footprint for each of the four project components (mine site, transportation corridor, port, and natural gas pipeline) described in Chapter 2, Alternatives, of the EIS. Table K2-10 through Table K2-12 summarize the difference in footprints for each of the variants analyzed under Alternative 1. Brackets around a number indicate a change between the variant and the base case for Alternative 1.

Table	K2-9:	Alternative	1	Project	Footprint
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Project Component	Facility	Permanent Footprint (acres)	Temporary Construction Footprint (acres) ¹	Length (miles)
	Open Pit	609		
	Sediment/Seepage Collection Systems	360		
	Bulk Tailings Storage Facility	2,797		
	Pyritic Tailings Storage Facility	1,000		
	Stockpiles	527		
	Quarries ²	860		
Mine Site	On-site Access Roads	860		39
Mine Site	Mineral Processing Facilities	113		
	Mill Site Power Plant	22		
	Mine Site Infrastructure	139		
	Water Management Ponds	1,066		
	Waste Management Facilities	17		
	Water Treatment Plants	19	<1	
	Mine Site Total	8,390	<1	39

Project Component	Facility	Permanent Footprint (acres)	Temporary Construction Footprint (acres) ¹	Length (miles)
	Iliamna Spur Road	119	72	9
	Explosive Storage Spur Road	4	2	<1
	Mine Access Road	Permanent Footprint (acres) Temporary Construction Footprint (acres)1 Length (miles) 119 72 9 Dad 4 2 <1	28	
	Kokhanok Spur Road			
	Pedro Bay Airport Spur Road			
	Port Access Road	411	288	37
Tuonon outotion	North Access Road			
Corridor	Water Extraction Pads and Access Roads	2	4	1
Contaol	Material Sites	251		
	North Ferry Terminal	4	2	
	South Ferry Terminal	23	5	
	Kokhanok East Ferry Terminal			
	Eagle Bay Ferry Terminal			
	Pile Bay Ferry Terminal			
	Transportation Corridor Total	1,171	607	77
	Amakdedori Port	26	6	
	Amakdedori Port Airstrip	6	4	
	Diamond Point Port			
Port	Diamond Point Port Dredging Area			
	Water Extraction Pads and Access Roads	1	<1	<1
	Iliamna Spur Road 119 Explosive Storage Spur Road 4 Mine Access Road 341 Kokhanok Spur Road 15 Pedro Bay Airport Spur Road Port Access Road 4111 North Access Road 4111 North Access Road Water Extraction Pads and Access Roads 2 Material Sites 251 North Ferry Terminal 4 South Ferry Terminal 23 Kokhanok East Ferry Terminal Eagle Bay Ferry Terminal Pile Bay Ferry Terminal Transportation Corridor Total 1,171 Amakdedori Port 26 Amakdedori Port Airstrip 6 Diamond Point Port Dredging Area Water Extraction Pads and Access Roads 1 Lightering Location Pad ³ 2 HDD Pullback Work Area Onshore Pipeline-Only Pipeline Corridor Segments Pipeline Construction Access Roads			
	Port Total	33	10	<1
	Compressor Station Pad ³	2		<1
	HDD Pullback Work Area		<1	
	Onshore Pipeline-Only Pipeline Corridor Segments		61	5
Natural Gas	Material Sites			
Pipeline	Pipeline Construction Access Roads			
	Cook Inlet Segment		628	104
	Cottonwood Bay Segment			
	Iliamna Lake Segment	4	120	19
	Natural Gas Pipeline Total	7	809	187 ⁴
	Alternative 1 Total	9,600	1,426	

Table K2-9: Alternative 1 Project Footprint

Notes:

Footprints are based on project GIS database. Numbers are rounded to the nearest whole number; therefore, the sum of individual facilities may not match the totals listed for the overall component.

¹ The temporary construction footprint for the transportation corridor and port components includes a 30-foot buffer around the permanent footprint where temporary construction-related activities would occur; except for water extraction site access roads, which include a 5-foot buffer. The temporary construction footprint for the onshore pipeline-only segments (i.e., not adjacent to an access road) of the natural gas pipeline component includes a 150-foot-wide impact corridor to account for pipeline trenching, side-casting, and equipment operation/travel. The temporary construction footprint for offshore segments of the natural gas pipeline (i.e., Iliamna Lake and Cook Inlet) varies (up to 102-foot maximum), as outlined in PLP 2019c.

² Includes Quarry B and Quarry C; Quarry A is in the footprint of the bulk TSF.

³ Includes the tie-in to the compressor station.

⁴ Total length of pipeline. Includes lengths for segments that are co-located with the transportation corridor access road(s) that are not listed under the natural gas pipeline section of the table.

< = less than

-- = not applicable

HDD = horizontal directional drilling

Project Component	Facility	Permanent Footprint (acres)	Temporary Construction Footprint (acres) ¹	Length (miles)			
	Open Pit	609					
	Sediment/Seepage Collection Systems	360	Temporary Construction Footprint (acres) ¹ <1				
	Bulk Tailings Storage Facility	2,797					
	Pyritic Tailings Storage Facility	1,000					
	Stockpiles	527					
	Quarries ²	860					
Mine Site	On-site Access Roads	[861]		39			
WINC OILC	Mineral Processing Facilities	[146]					
	Mill Site Power Plant	22					
	Mine Site Infrastructure	139					
	Water Management Ponds	527 860 ads [861] reads [146] nt 22 nt 22 tPonds 1,066 tt Ponds 17 tt Facilities 17 Ints 19 <1					
	Stockpiles 527 Quarries ² 860 On-site Access Roads [861] Mineral Processing Facilities [146] Mill Site Power Plant 22 Mine Site Infrastructure 139 Water Management Ponds 1,066 Waste Management Facilities 17 Water Treatment Plants 19 <1						
Specific National Section Systems 360 Bulk Tailings Storage Facility 2,797 Pyritic Tailings Storage Facility 1,000 Stockpiles 527 Quarries ² 860 On-site Access Roads [861] Mine Site Mineral Processing Facilities 1146] Mill Site Power Plant 22 Mine Site Infrastructure 139 Water Management Ponds 1,066 Waste Management Facilities 17 Water Treatment Plants 19 Mine Site Management Facilities 17 Water Treatment Plants 19 Iliamna Spur Road [8,423] Reylosive Storage Spur Road Noth Access Road North Access Road North Access Road North Access Road Noth Access Roads Material Sites North Access Road North Access Road North Access Roads Material Sites North Access Road North Access Road Transportation Corridor Total Ferry Terminal Eagle Bay Ferry Terminal Eagle Bay Ferry Terminal	<1						
	Mine Site Total	[8,423]	<1	39			
	Iliamna Spur Road						
Transportation Corridor	Explosive Storage Spur Road						
	Mine Access Road						
	Kokhanok Spur Road						
	Pedro Bay Airport Spur Road						
	Port Access Road		from Alternative 1 Transportation Corridor				
Transportation	North Access Road	No change tr	om Alternative 1 Trans	native 1 Transportation rridor			
Corridor	Water Extraction Pads and Access Roads	19 <1 Mine Site Total [8,423] <1 39 oad					
Transportation Corridor	Material Sites						
	North Ferry Terminal						
	South Ferry Terminal						
	Kokhanok East Ferry Terminal						
	Eagle Bay Ferry Terminal						
	Pile Bay Ferry Terminal						
		1,1/1	manent otprint (cres) Temporary Construction Footprint (acres) ¹ L (r (r) 609 360 360 <t< td=""><td>()</td></t<>	()			
	Amakdedori Port	[54]					
	Amakdedori Port Airstrip	б	4				
D - 14	Diamond Point Port		Temporary Construction Footprint (acres)1 <1				
Ροπ	Diamond Point Port Dreaging Area						
	Water Extraction Pags and Access Roads	[<1]	<1	<1			
		<u>< </u>					
Natural Cao	FUIL I Utal	נסטן	[11]	<u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>			
Natural Gas							
Pipeillie	HDD Pull Back work Area						
	Onshore Pipeline-Only Pipeline Corridor Segments	NI- abayaya fuaya	Altermetive 4 Network C				
	Material Sites	No change from	Alternative T Natural C	as Pipeline			
	Pipeline Construction Access Roads		Corridor				
	Cottonwood Bay Segment						
	Illamna Lake Segment	_		4074			
	Natural Gas Pipeline Total	1	809	187*			
	Alternative 1—Summer Only Operations	[9,661]	[1,427]				

Table K2-10: Alternative 1—Summer Only Ferry Operations Variant Project Footprint

Notes:

Footprints are based on project GIS database. Numbers are rounded to the nearest whole number; therefore, the sum of individual facilities may not match the totals listed for the overall component.

² Includes Quarry B and Quarry C; Quarry A is in the footprint of the bulk TSF.
 ³ Includes the tie-in to the compressor station.

⁴ Total length of pipeline. Includes lengths for segments that are co-located with the transportation corridor access road(s) that are not listed under the natural gas pipeline section of the table.

< = less than -- = not applicable HDD = horizontal directional drilling

¹ The temporary construction footprint for the transportation corridor and port components includes a 30-foot buffer around the permanent footprint where temporary construction-related activities would occur; except for water extraction site access roads, which include a 5-foot buffer. The temporary construction footprint for the onshore pipeline-only segments (i.e., not adjacent to an access road) of the natural gas pipeline component includes a 150-foot-wide impact corridor to account for pipeline trenching, side-casting, and equipment operation/travel. The temporary construction footprint for offshore segments of the natural gas pipeline (i.e., Iliamna Lake and Cook Inlet) varies (up to 102-foot maximum), as outlined in PLP 2019c.

Project Component	Facility	Permanent Footprint (acres)	Temporary Construction Footprint (acres) ¹	Length (miles)
	Open Pit			
	Sediment/Seepage Collection Systems		Temporary Construction Footprint (acres) ¹ Footprint (acres) ¹ from Alternative 1 Mi 72 2 224 [42] [3] [3] [3] [3] [3] [3] [3] [3] [3] [3] [3] [3] [3] [560] n Alternative 1 Amako 10 <10	
	Bulk Tailings Storage Facility			
	Pyritic Tailings Storage Facility			
	Stockpiles			
	Quarries ²		Temporary Construction Footprint (acres) ¹ Footprint (acres) ¹ from Alternative 1 Mines 72 2 224 [42] [212] [3] [3] [3] [3] [3] [3] [3] [3] [3] [3] [3] [3] [3] [3] [3] [3] [560] n Alternative 1 Amakde 628 [131] [845] [1,415] </td <td></td>	
Mine Site	On-site Access Roads	No change	e from Alternative 1 Mir	ne Site
Mine One	Mineral Processing Facilities			
	Mill Site Power Plant			
	Mine Site Infrastructure			
Mineral Processing Facilities Mill Site Power Plant Mine Site Infrastructure Water Management Ponds Waste Management Facilities Water Treatment Plants Mine Site Total Illiamna Spur Road Explosive Storage Spur Road Mine Access Road Kokhanok Spur Road Pedro Bay Airport Spur Road Port Access Road North Access Road Water Extraction Pads and Access Roads Material Sites North Ferry Terminal South Ferry Terminal Kokhanok East Ferry Terminal				
	Waste Management Facilities			
	Water Treatment Plants			
	Mine Site Total	8,390	<1	39
	Iliamna Spur Road	119	72	9
Project ComponentOpen Sedin Bulk T Pyritic Stock Quarr Mine Mine Water Waste Water Waste WaterTransportation CorridorIliamn Explo Mine J Kokha Pedro Port A North Water North South Kokha Eagle Pile B Trans PortPortAmak Amak Amak 	Explosive Storage Spur Road	4	2	<1
	Mine Access Road	341	Construction Footprint (acres) ¹ (miles) (miles) change from Alternative 1 Mine Site 0 <1	28
	Kokhanok Spur Road	[65]	[42]	[5]
	Pedro Bay Airport Spur Road			
	Port Access Road	[297]	[212]	[27]
Transportation	North Access Road			
Corridor	Water Extraction Pads and Access Roads	2	[3]	1
Comuoi	Material Sites	[358]		
	North Ferry Terminal	4	2	
	South Ferry Terminal			
	Kokhanok East Ferry Terminal	[15]	[3]	
	Eagle Bay Ferry Terminal	[]	[]	
	Pile Bay Ferry Terminal			
	Transportation Corridor Total	[1,205]	[560]	[70]
	Amakdedori Port			
	Amakdedori Port Airstrip		nent print (mint pes) Temporary (miles) Lengt (miles) change from Alternative 1 Mine Site $(miles)$ change from Alternative 1 Mine Site $(miles)$ 00 <1	
	Diamond Point Port	No chango fra		lodori Port
Port	Diamond Point Port Dredging Area	No change inc		IEUUII FUIL
	Water Extraction Pads and Access Roads		Dotprint acres) Construction Footprint (acres) ¹ (mild acres) ¹ No change from Alternative 1 Mine Site $(mild acres)^1$ $(mild acres)^1$ 8,390 <1	
	Lightering Location—Mooring Buoys and Anchors			
	Port Total	33	10	<1
Natural Gas	Compressor Station Pad ³	2		<1
Pipeline	HDD Pullback Work Area		<1	
	Onshore Pipeline-Only Pipeline Corridor Segments		[85]	7
	Material Sites			
	Pipeline Construction Access Roads			
	Cook Inlet Segment		628	104
	Cottonwood Bay Segment			
	Iliamna Lake Segment	4	[131]	[20]
	Natural Gas Pipeline Total	7	[845]	[185] ⁴
	Alternative 1—Kokhanok East Ferry Terminal Variant Total	[9,635]	[1,415]	

Table K2-11: Alternative 1—Kokhanok East Ferry Terminal Variant Project Footprint

Notes: Footprints are based on project GIS database. Numbers are rounded to the nearest whole number; therefore, the sum of individual facilities may not match the totals listed for the overall component.

³ Includes the tie-in to the compressor station.

⁴ Total length of pipeline. Includes lengths for segments that are co-located with the transportation corridor access road(s) that are not listed under the natural gas pipeline section of the table.

-- = not applicable GIS = Geographic Information System HDD = horizontal directional drilling ed Partnership TSF = tailings storage facility

< = less than PLP = Pebble Limited Partnership

The temporary construction footprint for the transportation corridor and port components includes a 30-foot buffer around the permanent footprint where temporary construction-related activities would occur; except for water extraction site access roads, which include a 5-foot buffer. The temporary construction footprint for the onshore pipeline-only segments (i.e., not adjacent to an access road) of the natural gas pipeline component includes a 150-foot-wide impact corridor to account for pipeline trenching, side-casting, and equipment operation/travel. The temporary construction footprint for offshore segments of the natural gas pipeline (i.e., Iliamna ² Includes Quarry B and Quarry C; Quarry A is in the footprint of the TSF.

Project Component	Facility	Permanent Footprint (acres)	Temporary Construction Footprint (acres) ¹	Length (miles)		
	Open Pit					
	Sediment/Seepage Collection Systems		Temporary Construction Footprint (acres)1 Image from Alternative 1 Min Image from Alternative 1 Min Image from Alternative 1 Min Image from Alternative 1 Trans Corridor Image from Alternative 1 Natural Image from Alternatimage from Alternative 1 Natural Image from Alternativ			
	Bulk Tailings Storage Facility	Facility Permanent Footprint (acres) Temporary Footprint (acres) Leng Construction Footprint (acres) bage Collection Systems torage Facility				
	Pyritic Tailings Storage Facility					
	FacilityPermaint Construction Footprint (acres)Length (miles)pen Pit ediment/Seepage Collection Systems ulk Tailings Storage Facility tockpiles uarries ² No change from Alternative 1 Mine SiteInteral Processing Facilities inigral Processing Facilities inter Access Road defor Bay Airport Spur Road oth Access Road defor Bay Airport Spur Road oth Access Road defor Bay Airport Spur Road oth Access Road alterial Sites outh Ferry Terminal agle Bay Ferry Terminal agle Bay Ferry Terminal ale Bay Ferry Terminal 					
		N 1 1	C ALL 1' 4 MA	0.1		
Mine Site	Unsite Access Roads	No change	e from Alternative 1 Mil	ne Site		
	Mineral Processing Facilities					
	Mill Site Power Plant					
	Mine Site Infrastructure					
	Water Management Ponds					
	Water Treatment Plants	0.000		20		
	Mine Site Total	8,390	<1	39		
	Iliamna Spur Road					
	Explosive Storage Spur Road					
Mine Access Road Kokhanok Spur Road Pedro Bay Airport Spur Road Port Access Road Port Access Road North Access Road North Access Road Water Extraction Pads and Access Roads Material Sites North Ferry Terminal South Ferry Terminal	Mine Access Road					
	Kokhanok Spur Road					
	Pedro Bay Airport Spur Road					
	Port Access Road					
	om Alternative 1 Trans	sportation				
	Water Extraction Pads and Access Roads		Corridor			
	Material Sites					
	North Ferry Terminal					
	South Ferry Terminal					
	Kokhanok East Ferry Terminal					
	Eagle Bay Ferry Terminal					
	Pile Bay Ferry Terminal					
	Iransportation Corridor Total	1,171	607	77		
	Amakdedori Port	[15]	[9]			
	Amakdedori Port Airstrip	6	4			
	Diamond Point Port					
Port	Diamond Point Port Dredging Area					
	Water Extraction Pads and Access Roads	1	<1	<1		
	Lightering Location—Mooring Buoys and Anchors	<1				
		[22]	[13]	<1		
	Compressor Station Pad ³					
	HDD Pullback Work Area					
	Onshore Pipeline-Only Pipeline Corridor Segments					
Natural Gas	Material Sites	No change from Alternative 1 Mine Site al 8,390 <1				
Pipeline	Pipeline Construction Access Roads		change from Alternative 1 Mine Site 0 <1			
	Cook Inlet Segment					
	Cottonwood Bay Segment					
	Iliamna Lake Segment	<u></u>				
	Natural Gas Pipeline Total	Permanent Footprint (acres) Temporary Construction Footprint (acres) ¹ No change from Alternative 1 Minu Total 8,390 Total 8,390 No change from Alternative 1 Transp Corridor No change from Alternative 1 Transp Corridor Total 1,171 6 4 1 1 1 1 2 1 1	187 ⁴			
	Alternative 1—Amakdedori Port Pile- Supported Dock Variant Total	[9,589]	[1,429]			

Table K2-12: Alternative 1—Amakdedori Port Pile-Supported Dock Variant Project Footprint

Notes:

Footprints are based on project GIS database. Numbers are rounded to the nearest whole number; therefore, the sum of individual facilities may not match the totals listed for the overall component.

⁴ Total length of pipeline. Includes lengths for segments that are co-located with the transportation corridor access road(s) that are not listed under the natural gas pipeline section of the table.

-- = not applicable GIS = Geographic Information System HDD = horizontal directional drilling ed Partnership TSF = tailings storage facility < = less than

PLP = Pebble Limited Partnership

¹ The temporary construction footprint for the transportation corridor and port components includes a 30-foot buffer around the permanent footprint where temporary construction-related activities would occur; except for water extraction site access roads, which include a 5-foot buffer. The temporary construction footprint for the onshore pipeline-only segments (i.e., not adjacent to an access road) of the natural gas pipeline component includes a 150-foot-wide impact corridor to account for pipeline trenching, side-casting, and equipment operation/travel. The temporary construction footprint for offshore segments of the natural gas pipeline (i.e., lliamna equipment operation/travel. The temporary construction footprint for offshore segments of the natural gas pipeline (i.e., lliamna equipment operation/travel. Lake and Cook Inlet) varies (up to 102-foot maximum), as outlined in PLP 2019c. ² Includes Quarry B and Quarry C; Quarry A is in the footprint of the bulk TSF. ³ Includes the tie-in to the compressor station.

K2.2.2Material Sites

Construction materials would be excavated from borrow material sites along the transportation corridor roads. Table K2-13 provides information for Alternative 1 material sites, including the estimated quantities, size, type of material, use of material, and whether blasting is required. Table K2-14 provides information for the Alternative 1 Kokhanok East Ferry Terminal Variant material sites. Figure K2-3 and Figure K2-4 show the location of material sites proposed for Alternative 1, including the Kokhanok East Ferry Terminal Variant.

Site	Quantity (cubic yards)	Size (acres) ¹	Туре	Blasting Required (Yes/No)	Use		
		Port Acce	ss Road				
MS-A01	600,000	9	Rock and gravel	Yes	Road, Pipeline		
MS-A02	500,000	10	Rock and gravel	Yes	Road, Pipeline		
MS-A03	400,000	20	Rock	Yes	Road, Pipeline		
MS-A04	400,000	22	Rock	Yes	Road, Pipeline		
MS-A05	700,000	20	Rock	Yes	Road, Pipeline		
MS-A06	400,000	19	Rock	Yes	Road, Pipeline		
MS-A07	500,000	20	Rock	Yes	Road, Pipeline		
MS-A08	400,000	20	Rock	Yes	Road, Pipeline, Port		
	Mine Access Road						
MS-T00	200,000	8	Gravel	No	Road, Pipeline		
MS-T01	700,000	12	Rock and gravel	Yes	Road, Pipeline		
MS-T02	200,000	13	Gravel	No	Road, Pipeline		
MS-T03	200,000	8	Gravel	No	Road, Pipeline		
MS-T04	300,000	9	Gravel	No	Road, Pipeline		
MS-T05	100,000	9	Rock and gravel	Yes	Road, Pipeline		
MS-T06	500,000	9	Gravel	No	Road, Pipeline		
MS-T07	700,000	14	Gravel	No	Road, Pipeline		
		lliamna Sp	our Road				
MS-N01	200,000	10	Gravel	No	Road, Pipeline		
MS-N02	300,000	9	Gravel	No	Road, Pipeline		
MS-N03	200,000	9	Gravel	No	Road, Pipeline		
Alternative 1 Total	7,500,000	251					

Table K2-13: Alternative 1 Material Site Quantities Estimates

Notes:

¹ Represents area of permanent impacts. Numbers are approximate and rounded

Source: Project GIS database





Table K2-14: Alternative 1—Kokhanok East Ferry Terminal Variant Material Site Quantities Estimates

Site	Quantity (cubic yards)	Size (acres) ¹	Туре	Blasting Required (Yes/No)	Use		
		Port Acce	ss Road				
MS-A04	400,000	22	Rock	Yes	Road, Pipeline		
MS-A05	700,000	20	Rock	Yes	Road, Pipeline		
MS-A06	400,000	19	Rock	Yes	Road, Pipeline		
MS-A07	500,000	20	Rock	Yes	Road, Pipeline		
MS-A08	400,000	22	Rock	Yes	Road, Pipeline, Port		
		Kokhanok Eas	st Spur Road	·			
MS-K01	800,000	68	Rock	Yes	Road, Pipeline		
MS-K02	300,000	26	Rock	Yes	Road, Pipeline		
MS-K03	500,000	52	Rock	Yes	Road, Pipeline		
	Mine Access Road						
MS-T00	200,000	8	Gravel	No	Road, Pipeline		
MS-T01	700,000	12	Rock and gravel	Yes	Road, Pipeline		
MS-T02	200,000	13	Gravel	No	Road, Pipeline		
MS-T03	200,000	8	Gravel	No	Road, Pipeline		
MS-T04	300,000	9	Gravel	No	Road, Pipeline		
MS-T05	100,000	9	Rock and gravel	Yes	Road, Pipeline		
MS-T06	500,000	9	Gravel	No	Road, Pipeline		
MS-T07	700,000	14	Gravel	No	Road, Pipeline		
		lliamna Sp	our Road				
MS-N01	200,000	10	Gravel	No	Road, Pipeline		
MS-N02	300,000	9	Gravel	No	Road, Pipeline		
MS-N03	200,000	9	Gravel	No	Road, Pipeline		
Alternative 1— Kokhanok East Ferry Terminal Variant Total	7,600,000	358					

Notes: ¹ Represents area of permanent impacts. Numbers are approximate and rounded Source: Project GIS database

K2.2.3Water Extraction Sites

Water extraction from sources along the transportation corridor would be necessary to support project construction and operations (Figure K2-3 and Figure K2-4). Table K2-15 provides information for Alternative 1 water extraction sites, including the waterbody type, use, years and season of use, and estimated extraction rate and volumes. Table K2-16 provides information for Alternative 1 Kokhanok East Ferry Terminal Variant water extraction sites.

					Extra	ction
Water Extraction Site	All-Season (Yes/No)	Waterbody Type	Use	Years of Use	Rate (gpm)	Annual Volume (gal)
		Port A	ccess Road			
WES-01	Yes	Stream	Construction	Life of mine	1,000	5M
WES-02	Yes	Stream	Construction and testing	3	500	3M
WES-03	Yes	Lake	Construction	Life of mine	500	1M
WES-04	Yes	Stream	Construction	3	500	2M
WES-05	Yes	Lake	Construction	Life of mine	500	1M
WES-06	Yes	Pond	Construction	3	500	1M
WES-07	Yes	Stream	Construction	Life of mine	500	1M
WES-08	Yes	Lake	Construction	3	500	1M
WES-09	Yes	Stream	Construction and testing	3	1,000	1M
WES-10	Yes	Lake	Construction and testing	Life of mine	1,000	8M
		Mine Site	Access Road			
WES-11	Yes	Lake	Construction	Life of mine	1,000	8M
WES-12	Yes	Stream	Construction	3	500	1M
WES-13	Yes	Stream	Construction	Life of mine	500	1M
WES-14	Yes	Stream	Construction	3	500	1M
WES-15	Yes	Lake	Construction	3	1,000	5M
WES-16	Yes	Stream	Construction and testing	Life of mine	500	1M
WES-17	Yes	Pond	Construction	3	500	1M
WES-18	Yes	Pond	Construction	3	500	1M
		lliamna	a Spur Road			
WES-19	Yes	Lake	Construction	Life of mine	500	1M
WES-20	Yes	Stream	Construction	3	1,000	5M
				Alternat	tive 1 Total	49M

Notes:

gal = gallons

gpm = gallons per minute Source: Project GIS database

Table K2-16: Alternative 1 Kokhanok East Ferry Terminal Variant Water Extraction Site Quantity Estimates

					Extra	ction		
Water Extraction Site	All-Season (Yes/No)	Waterbody Type	Use	Years of Use	Rate (gpm)	Annual Volume (gal)		
		Ροι	rt Access Road					
WES-01	Yes	Stream	Construction	Life of mine	1,000	5M		
WES-02	Yes	Stream	Construction and testing	3	500	3M		
WES-03	Yes	Lake	Construction	Life of mine	500	1M		
WES-04	Yes	Stream	Construction	3	500	2M		
WES-05	Yes	Lake	Construction	Life of mine	500	1M		
WES-06	Yes	Pond	Construction	3	500	1M		
WES-KE36	Yes	Lake	Road and pipeline construction	Life of mine	1,000	8M		
WES-KE37	Yes	Lake	Road and pipeline construction	3	500	3M		
	·	Kokhar	ok East Spur Road	·				
WES-KE38	Yes	Stream	Road and pipeline construction	3	500	3M		
WES-KE39	Yes	Lake	Road and pipeline construction	3	500	3M		
		Mine	Site Access Road					
WES-11	Yes	Lake	Construction	Life of mine	1,000	8M		
WES-12	Yes	Stream	Construction	3	500	1M		
WES-13	Yes	Stream	Construction	Life of mine	500	1M		
WES-14	Yes	Stream	Construction	3	500	1M		
WES-15	Yes	Lake	Construction	3	1,000	5M		
WES-16	Yes	Stream	Construction and testing	Life of mine	500	1M		
WES-17	Yes	Pond	Construction	3	500	1M		
WES-18	Yes	Pond	Construction	3	500	1M		
	lliamna Spur Road							
WES-19	Yes	Lake	Construction	Life of mine	500	1M		
WES-20	Yes	Stream	Construction	3	1,000	5M		
		Alternative	1—Kokhanok East	Ferry Terminal V	ariant Total	55M		

Notes:

gal = gallons gpm = gallons per minute M = million Source: Project GIS database

K2.2.4Access Roads to Water Extraction Sites

All-season gravel roads would be necessary to access some of the water extraction sites proposed for Alternative 1 (Figure K2-3 and Figure K2-4). Table K2-17 provides details on the location, approximate length, and acreage of each planned access road. These apply to the Alternative 1 base case and the Alternative 1—Kokhanok East Ferry Terminal Variant.

Name	Nearest Mile Post	Length (miles)	Permanent Footprint (acres) ¹	Temporary Construction Footprint (acres)
AWES-01	PAR MP-0	<1	1	<1
AWES-03	PAR MP-8	<1	<1	<1
AWES-05	PAR MP-15	<1	<1	<1
AWES-06	PAR MP-20	<1		<1
AWES-08	PAR MP-26	<1		<1
AWES-11	MAR MP-01	<1	<1	<1
AWES-12	MAR MP-5	<1		2
AWES-13	MAR MP-10	<1	<1	<1
AWES-15	MAR MP-16	<1		1
AWES-19	ISAR MP-4	<1	1	<1
AWES-20	ISAR MP-20	<1	<1	<1
Alternative 1 Total		1	3	4

 Table K2-17: Alternative 1 Water Extraction Site Access Roads

Notes:

¹Represents area of permanent impacts. Numbers are approximate and rounded

< = less than

-- = not applicable

Source: Project GIS database

K2.3 ALTERNATIVE 2-NORTH ROAD AND FERRY WITH DOWNSTREAM DAMS

K2.3.1 Alternative 2 Project Components Footprints

Table K2-18 provides a summary of the Alternative 2—North Road and Ferry with Downstream Dams project footprint for each of the four project components (mine site, transportation corridor, port, and natural gas pipeline) described in Chapter 2, Alternatives, of the EIS. Table K2-19 through Table K2-21 summarize the difference in footprints for each of the variants analyzed under Alternative 2. Brackets around a number indicate a change between the variant and the base case Alternative 2.

Project Component	Facility	Permanent Footprint (acres)	Temporary Construction Footprint (acres) ¹	Length (miles)
	Open Pit	609		
	Sediment/Seepage Collection Systems	361		
Mino Sito	Bulk Tailings Storage Facility	2,907		
	Pyritic Tailings Storage Facility	1,000		
	Stockpiles	527		
	Quarries ²	860		
Mine Site	Onsite Access Roads	856		39
	Mineral Processing Facilities	113		
	Mill Site Power Plant	22		
	Mine Site Infrastructure	139		
	Water Management Ponds	1,066		
	Waste Management Facilities	17		
	Water Treatment Plants	19	<1	
	Mine Site Total	8,497	<1	39
	Iliamna Spur Road			
	Explosive Storage Spur Road	4	2	<1
	Mine Access Road	353	291	35
	Kokhanok Spur Road			
	Pedro Bay Airport Spur Road			
	Port Access Road	209	138	18
Transportation	North Access Road			
Corridor	Water Extraction Pads and Access Roads	<1	<1	<1
Comdoi	Material Sites	321		
	North Ferry Terminal			
	South Ferry Terminal			
	Kokhanok East Ferry Terminal			
	Eagle Bay Ferry Terminal	7	2	
	Pile Bay Ferry Terminal	18	3	
	Iransportation Corridor Total	912	437	54
	Amakdedon Pon			
	Diamond Doint Dort ³			
Port	Diamond Point Port Drodging Area	55	23 58	
	Mater Extraction Pade and Access Poads		50	
	Lightering Leastion Meaning Buove and Anchore			
	Lightening Location – Mooning Budys and Anchors	55		
	Compressor Station Pad ⁴	2		<1
	HDD Pullback Work Area		<1	
	Onshore Pipeline-Only Pipeline Corridor Segments		777	44
Natural Cas	Material Sites	298		
Natural Gas	Pipeline Construction Access Roads		29	
Fipeline	Cook Inlet Segment		618	75
	Cottonwood Bay Segment		27	3
	Iliamna Lake Segment			
	Natural Gas Pipeline Total	300	1,451	164 ⁵
	Alternative 2 Total	9,763	1,968	

Table K2-18: Alternative 2 Project Footprint

Notes:

Footprints are based on project GIS database. Numbers are rounded to the nearest whole number; therefore, the sum of individual facilities may not match the totals listed for the overall component.

³ Includes the onshore dredge material storage areas adjacent to the port facility.

⁴ Includes the tie-in to the compressor station.

⁵ Total length of pipeline. Includes lengths for segments that are co-located with the transportation corridor access road(s) that are not isted under the natural gas pipeline section of the table.
 = less than --- = not applicable GIS = Geographic Information System HDD = horizontal directional drilling PLP = Pebble Limited Partnership TSF = tailings storage facility

¹ The temporary construction footprint for the transportation corridor and port components includes a 30-foot buffer around the permanent footprint where temporary construction-related activities would occur; except for water extraction site access roads, which includes a 5-foot buffer. The temporary construction footprint for the onshore pipeline-only segments (i.e., not adjacent to an access road) of the natural gas pipeline component includes a 150-foot-wide impact corridor to account for pipeline trenching, side-casting, and equipment operation/travel. The temporary construction footprint for offshore segments of the natural gas pipeline (i.e., lliamna Lake and Cook Inlet) varies (up to 183-foot maximum). ² Includes Quarry B and Quarry C; Quarry A is in the footprint of the bulk TSF

Project Component	Facility	Permanent Footprint (acres)	Temporary Construction Footprint (acres) ¹	Length (miles)	
	Open Pit				
	Sediment/Seepage Collection Systems				
	Bulk Tailings Storage Facility				
Mine Site	Pyritic Tailings Storage Facility				
	Stockpiles				
			6 AU 11 O M	0.1	
	Onsite Access Roads	No chang	e from Alternative 2 M	ine Site	
	Mineral Processing Facilities				
	Mill Site Power Plant				
	Mine Site Infrastructure				
	Water Management Ponds				
	Waste Management Facilities				
	Water Treatment Plants	0.407		20	
	Mine Site Total	8,497		39	
	Illamna Spur Road				
	Explosive Storage Spur Road	4	2	<1	
	Mine Access Road	[300]	290	35	
	Roknanok Spur Road				
	Pedro Bay Aliport Spur Road		120		
	Poll Access Road	209	130	10	
Transportation Corridor	North Access Road				
	Material Sites	12001		~1	
	North Forny Torminal	[330]			
	South Ferry Terminal				
	South Ferry Terminal				
	For any Former Terminal	7	2		
	Dilo Boy Forry Terminal	19	2		
	Transportation Corridor Total	10 [032]	/37	54	
	Amakdadari Part	[552]	457	54	
	Amakdedori Port Airstrin				
	Diamond Doint Dort ³	No change from Alternative 2 Diamond Point Port			
Port	Diamond Point Port Dredging Area				
1 OIL	Water Extraction Pads and Access Roads				
	Lightering Location – Mooring Buove and Anchore	-			
	Port Total	55	80		
	Compressor Station Pad ⁴		00		
	HDD Bullback Work Area				
	Onshore Dipoline Only Dipoline Corrider Segments				
	Material Sites	No chango	from Altornativo 2 Nat	ural Cas	
Natural Gas	Dingling Construction Access Reads	No change	Dipeline Corridor	ulai Gas	
Pipeline	Cook Intel Segment				
	Cottonwood Bay Segment				
	Ilionna Lake Segment				
	Natural Gas Pinolino Total	300	1 451	1645	
	Altornativo 2 Nouholon Diver North	500	1,451	104	
	Crossing Variant Total	[9,783]	1,968		

Table K2-19: Alternative 2—Newhalen River North Crossing Variant Project Footprint

Notes:

Footprints are based on project GIS database. Numbers are rounded to the nearest whole number; therefore, the sum of individual facilities may not match the totals listed for the overall component.

⁵ Total length of pipeline. Includes lengths for segments that are co-located with the transportation corridor access road(s) that are not listed under the natural gas pipeline section of the table. < = less than -- = not applicable GIS = Geographic Information System HDD = horizontal directional drilling PLP = Pebble Limited Partnership TSF = tailings storage facility

The temporary construction footprint for the transportation corridor and port components includes a 30-foot buffer around the permanent footprint where temporary construction-related activities would occur; except for water extraction site access roads, which includes a 5-foot buffer. The temporary construction footprint for the onshore pipeline-only segments (i.e., not adjacent to an access road) of the natural gas pipeline component includes a 150-foot-wide impact corridor to account for pipeline trenching, side-casting, and equipment operation/travel. The temporary construction footprint for offshore segments of the natural gas pipeline (i.e., Iliamna ² Includes Quarry B and Quarry C; Quarry A is in the footprint of the bulk TSF.
 ³ Includes the onshore dredge material storage areas adjacent to the port facility.
 ⁴ Includes the tie-in to the compressor station.

Project Component	Facility	Permanent Footprint (acres)	Temporary Construction Footprint (acres) ¹	Length (miles)	
	Open Pit	609			
	Sediment/Seepage Collection Systems	361			
	Bulk Tailings Storage Facility	2,907			
	Pyritic Tailings Storage Facility	1,000			
	Stockpiles	527			
	Quarries ²	860			
Mine Site	On-site Access Roads	[857]		39	
	Mineral Processing Facilities	[146]			
	Mill Site Power Plant	22			
	Mine Site Infrastructure	139			
	Water Management Ponds	1,066			
	Waste Management Facilities	17			
	Water Treatment Plants	19	<1		
	Mine Site Total	[8,530]	<1	39	
	Iliamna Spur Road				
	Explosive Storage Spur Road	4	2	<1	
Transportation Corridor	Mine Access Road	353	291	35	
	Kokhanok Spur Road				
	Pedro Bay Airport Spur Road				
	Port Access Road	[231]	[139]	18	
	North Access Road				
	Water Extraction Pads and Access Roads	<1	<1	<1	
		321			
	North Ferry Terminal				
	South Ferry Terminal				
	Koknanok East Ferry Terminal				
	Eagle Bay Ferry Terminal	10	2		
	Pile Bay Ferry Terminal	10	ن ۲۸۵۵۱		
	Transportation Corridor Total	[934]	[430]	54	
	Amakdedori Port				
	Diamond Doint Dort ³	No change from Alternative 2 Diamond Doint			
Dort	Diamond Point Port Dredging Area	No change in	Dort Dian	iona Point	
FUIL	Water Extraction Pade and Access Reads		FUIL		
	Lightering Leastion Maaring Pueve and Anabara				
	Lightening Location – Mooning Budys and Anchors	55	80		
	Comprossor Station Pad ⁴	55	00		
	HDD Dullback Work Area				
	ADD Fullback Wolk Alea	No change from Alternative 2 Notwood Coo			
	Meterial Sites				
Natural Gas	Dipolino Construction Access Reads	No change	Dineline Corridor	urai Gas	
Pipeline	Cook Intel Segment				
	Cottonwood Bay Sogmont				
	Uliampa Lake Segment				
	Natural Gas Dinaling Total	300	1 451	16/5	
	Altornative 2 Summer Only Formy Oncretions	500	1,431	104	
	Variant Total	[9,819]	1,969	132	

Table K2-20: Alternative 2—Summer Only Ferry Operations Variant Project Footprint

Notes:

Footprints are based on project GIS database. Numbers are rounded to the nearest whole number; therefore, the sum of individual facilities may not match the totals listed for the overall component.

⁴ Includes the tie-in to the compressor station.

⁵ Total length of pipeline. Includes lengths for segments that are co-located with the transportation corridor access road(s) that are not

 Isted under the natural gas pipeline section of the table.

 < = less than</td>
 -- = not applicable

 GIS = Geographic Information System
 HDD = horizontal directional drilling

 PLP = Pebble Limited Partnership
 TSF = tailings storage facility

¹ The temporary construction footprint for the transportation corridor and port components includes a 30-foot buffer around the permanent footprint where temporary construction-related activities would occur; except for water extraction site access roads, which includes a 5-foot buffer. The temporary construction footprint for the onshore pipeline-only segments (i.e., not adjacent to an access road) of the natural gas pipeline component includes a 150-foot-wide impact corridor to account for pipeline trenching, side-casting, and equipment operation/travel. The temporary construction footprint for offshore segments of the natural gas pipeline (i.e., lliamna Lake and Cook Inlet) varies (up to 183-foot maximum). ² Includes Quarry B and Quarry C; Quarry A is in the footprint of the bulk TSF. ³ Includes the onshore dredge material storage areas adjacent to the port facility.

Open Pit Sediment/Seepage Collection Systems Bulk Tailings Storage Facility Wine Site Bulk Tailings Storage Facility Onsite Access Roads No change from Alternative 2 Mine Site Mine Site Onsite Access Roads Mine Site Mineral Processing Facilities Mili Site Power Plant Mile Site Infrastructure Water Management Ponds Water Management Facilities Water Management Facilities Water Treatment Facilities Water Cacess Road Mine Site Total Rokhanok Spur Road Rokhanok Spur Road Ford Access Road No change from Alternative 2 Transportation Corridor North Access Road North Access Road No change from Alternative 2 Transportation Corridor Material Sites North Ferry Terminal South Ferry Terminal Eagle Bay Ferry Terminal	Project Component	Facility	Permanent Footprint (acres)	Temporary Construction Footprint (acres) ¹	Length (miles)			
Mine Site Sediment/Seepage Collection Systems Bulk Tailings Storage Facility Stockpiles Quarries ² Onsite Access Roads Mine Site Onsite Access Roads Mineral Processing Facilities Mineral Processing Facilities Mile Site Infrastructure Water Treatment Plants Water Management Facilities Water Treatment Plants Water Treatment Plants Mine Site Total Rexpose Storage Spur Road Kokhanok Spur Road Explosive Storage Spur Road No change from Alternative 2 Transportation Perfor Bay Airport Spur Road Pedro Bay Airport Spur Road Port Access Road Not harge from Alternative 2 Transportation Corridor Noth Ferry Terminal Bay Ferry Terminal Pedro Bay Airport Spur Road Port Access Road North Ferry Terminal Pole Bay Ferry Terminal Pile Bay Ferry Terminal Pole Diamond Point Port 3 [44] Port Diamond Point Port Bas and Access Roads Port Otal Port Total Sa and Access Roads Port Compressor Station Pad ⁴ HDD Pullback Work Area Port Total Material Sites Port Total		Open Pit						
Bulk Tailings Storage Facility Pyritic Tailings Storage Facility Stockpiles Quarries ² Onsite Access Roads Mine Site Mineral Processing Facilities Mill Site Power Plant Mine Site Infrastructure Water Management Ponds Water Treatment Plants Water Treatment Plants Bulk Tailings Storage Spur Road Explosive Storage Spur Road Port Access Road North Access Road <td></td> <td>Sediment/Seepage Collection Systems</td> <td></td> <td></td> <td></td>		Sediment/Seepage Collection Systems						
Pyrific Tailings Storage Facility Stockpiles Quarries ² Onsite Access Roads Mine Site Mine Site Infrastructure Water Management Ponds Waste Management Ponds Water Management Pants Water Treatment Plants Iliamna Spur Road Explosive Storage Spur Road Kokhanok Spur Road Port Access Road Not change from Alternative 2 Transportation Corridor Material Sites Noth Ferry Terminal South Ferry Terminal South Ferry Terminal South Ferry Terminal Port Eagle Bay Ferry Terminal Port Diamond Point Port [®] Port Diamond Point Port Drot Drot Drot Drot Drot Drot Drot D		Bulk Tailings Storage Facility						
Stockpiles No change from Alternative 2 Mine Site Mine Site Onsite Access Roads No change from Alternative 2 Mine Site Mile Site Power Plant Mile Site Power Plant No change from Alternative 2 Mine Site Water Management Ponds Water Treatment Plants 8,497 <1	Mino Sito	Pyritic Tailings Storage Facility						
Mine Site Quarries' Onsite Access Roads No change from Alternative 2 Mine Site Mine Site Mineral Processing Facilities Mine Site Infrastructure Water Management Ponds Water Management Ponds Water Constructure Water Management Ponds Water Treatment Plants Water Treatment Plants Mine Site Infrastructure Water Splosive Storage Spur Road Kokhanok Spur Road Port Access Road North Access Road North Access Road North Access Road North Ferry Terminal South Ferry Terminal South Ferry Terminal Fort Access Roads North Access Road Fort Added Port Access Roads North Access Road North Access Road North Ferry Terminal Fort Terminal Bouth Ferry Terminal Fort Terminal Port Madedori Port		Stockpiles						
Mine Site Onsite Access Roads No change from Alternative 2 Mine Site Mine Site Infrastructure Mine Site Infrastructure Mine Site Infrastructure Water Management Ponds Water Treatment Plants 8,497 <1		Quarries ²						
Mineral Processing Facilities Mill Site Power Plant Mine Site Infrastructure Water Management Ponds Waster Management Facilities Water Treatment Plants Iliamna Spur Road Explosive Storage Spur Road Mine Access Road Port Access Road North Access Road North Access Road North Access Road Water Extraction Pads and Access Roads Material Sites North Access Road North Access Road Water Extraction Pads and Access Roads North Ferry Terminal South Ferry Terminal Bay Ferry Terminal Port Port Diamond Point Port Airstrip Mater Extraction Pads and Access Roads Maddedori Port Diamond Point Port Port Gaing Area Diamond Point Port Port Port Total Port Total Inder Extraction Pads and Access Roads Diamond Point Port Dredging Area	Mine Site	Onsite Access Roads	No change	e from Alternative 2 M	Vine Site			
Mill Site Power Plant Mine Site Infrastructure Water Management Ponds Water Treatment Plants Water Treatment Plants Illamna Spur Road Explosive Storage Spur Road Mine Access Road Kokhanok Spur Road Pedro Bay Airport Spur Road Port Access Road North Ferry Terminal South Ferry Terminal South Ferry Terminal Rokhanok East Ferry Terminal Port Port Access Road North Ferry Terminal South Ferry Terminal Port Access Road North Ferry Terminal Bay Ferry Terminal Port Access Roads Port Access Road Access Roads North Ferry Terminal Port Access Road Access Roads North Ferry Terminal Bay Ferry Terminal Port Access Roads Port Access Roads North Ferry Terminal Port Access Roads Port Access Roads <		Mineral Processing Facilities						
Mine Site Infrastructure Water Management Ponds Water Treatment Plants Image: Storage Spur Road Explosive Storage Spur Road Mine Access Road Kokhanok Spur Road Pedro Bay Airport Spur Road Port Access Road No change from Alternative 2 Transportation Corridor No th Access Road Material Sites North Ferry Terminal South Ferry Terminal Kokhanok East Ferry Terminal Roth Ferry Terminal Port Access Road Noth Ferry Terminal Roth Port Airstrip Port Access Road Port Alternative Port Port Access Road No the Ferry Terminal Rokedori Port Port Access Roads of Access Roads Port Alternative 2 Transportation Corridor Total Port Amakdedori Port Port Access Road Port Airstrip Port Alternative 2 Transportation Corridor Total Port Access Roads of Access Roads Port Alternative 2 Natural Gas Port Total Port Total Diamond Point Port Port Arestrip		Mill Site Power Plant						
Water Management Facilities Water Treatment Plants Iliamna Spur Road Explosive Storage Spur Road Mine Access Road Kokhanok Spur Road Pedro Bay Airport Spur Road Port Access Road North Ferry Terminal South Ferry Terminal South Ferry Terminal Bay Ferry Terminal Pile Bay Ferry Terminal Pile Bay Ferry Terminal Point Opint Port Access Roads Imagement Facilities North Ferry Terminal South Ferry Terminal Point Point Port Airstrip Imagement Facilities Port Diamond Point Port Dredging Area Ightering Location – Mooring Buoys and Anchors Vater Extraction Pads HDD Pullback Work Area Onshore Pipeline-Only Pipeline Corridor Segments No change from Alternative 2 Natural Gas		Mine Site Infrastructure						
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South Perry Terminal Kokhanok East Ferry Terminal Eagle Bay Ferry Terminal Pile Bay Ferry Terminal Pile Bay Ferry Terminal Pile Bay Ferry Terminal Amakdedori Port Amakdedori Port Amakdedori Port Airstrip Diamond Point Port3 Diamond Point Port Dredging Area Water Extraction Pads and Access Roads Image: Compressor Station Pad ⁴ HDD Pullback Work Area Onshore Pipeline-Only Pipeline Corridor Segments Natural Gas		South Formy Terminal						
Rownands Last Perry Terminal File Bay Ferry Terminal Pile Bay Ferry Terminal Pile Bay Ferry Terminal Amakdedori Port Amakdedori Port Amakdedori Port Airstrip Diamond Point Port3 Diamond Point Port Dredging Area Water Extraction Pads and Access Roads Uightering Location – Mooring Buoys and Anchors Port Total Induction Pads Amakdedori Pads Port Total Induction Pads Patternal Gas Material Sites <td></td> <td>Kokhanok East Forry Torminal</td>		Kokhanok East Forry Torminal						
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Ine Day Ferry Terminal Transportation Corridor Total 912 437 54 Amakdedori Port Amakdedori Port Diamond Point Port Airstrip Diamond Point Port Id41 [30] Water Extraction Pads and Access Roads Water Extraction Pads and Access Roads Uightering Location – Mooring Buoys and Anchors <1		Pile Bay Ferry Terminal						
Amakdedori Port Amakdedori Port Diamond Point Port3 [44] [30] Diamond Point Port Dredging Area 58 Water Extraction Pads and Access Roads Uightering Location – Mooring Buoys and Anchors <1		Transportation Corridor Total	912	437	54			
Amadedon Fort Image: Compressor Station Pad ⁴ Port Image: Compressor Station Pad ⁴ HDD Pullback Work Area Onshore Pipeline-Only Pipeline Corridor Segments Natural Gas Material Sites		Amakdedori Port	512	407	54			
Port Diamond Point Port ³ [44] [30] Diamond Point Port Dredging Area 58 Water Extraction Pads and Access Roads 58 Lightering Location – Mooring Buoys and Anchors <1		Amakdedori Port Airstrin						
Port Diamond Point Port Dredging Area 58 Water Extraction Pads and Access Roads Lightering Location – Mooring Buoys and Anchors <1		Diamond Point Port ³	[44]	[30]				
Water Extraction Pads and Access Roads Lightering Location – Mooring Buoys and Anchors <1	Port	Diamond Point Port Dredging Area	 	58				
Lightering Location – Mooring Buoys and Anchors <1	1 oft	Water Extraction Pads and Access Roads						
Port Total [44] [88] Compressor Station Pad ⁴ HDD Pullback Work Area Onshore Pipeline-Only Pipeline Corridor Segments No change from Alternative 2 Natural Gas		Lightering Location – Mooring Buoys and Anchors	<1					
Compressor Station Pad ⁴ HDD Pullback Work Area Onshore Pipeline-Only Pipeline Corridor Segments Material Sites No change from Alternative 2 Natural Gas		Port Total	[44]	[88]				
HDD Pullback Work Area Onshore Pipeline-Only Pipeline Corridor Segments Material Sites No change from Alternative 2 Natural Gas		Compressor Station Pad ⁴	L · · 1	[00]				
Onshore Pipeline-Only Pipeline Corridor Segments Material Sites No change from Alternative 2 Natural Gas		HDD Pullback Work Area						
Natural Gas Material Sites No change from Alternative 2 Natural Gas		Onshore Pipeline-Only Pipeline Corridor Segments						
Natural Gas Material Oldo		Material Sites	No change	from Alternative 2 Na	atural Gas			
Pipeline Construction Access Roads I Pipeline Corridor	Natural Gas	Pipeline Construction Access Roads	onango	Pipeline Corridor				
Pipeline Cook Inlet Segment	Pipeline	Cook Inlet Segment		· · · · · · · · · · · · · · · · · · ·				
Cottonwood Bay Segment		Cottonwood Bay Segment						
Iliamna Lake Segment			1					
Natural Gas Pipeline Total 300 1.451 164⁵	1	Iliamna Lake Segment						
Altermetive 2 Diamond Daint Dart Dila		Iliamna Lake Segment Natural Gas Pipeline Total	300	1,451	164 ⁵			
Alternative 2—Diamond Point Port Pile-1 to 7521		Iliamna Lake Segment Natural Gas Pipeline Total Alternative 2—Diamond Point Port Pile-	300	1,451	164 ⁵			

Table K2-21: Alternative 2—Diamond Point Port Pile-Supported Dock Variant Project Footprint

Notes

Footprints are based on project GIS database. Numbers are rounded to the nearest whole number; therefore, the sum of individual facilities may not match the totals listed for the overall component.

¹ The temporary construction footprint for the transportation corridor and port components includes a 30-foot buffer around the permanent footprint where temporary construction-related activities would occur; except for water extraction site access roads, which includes a 5-foot buffer. The temporary construction footprint for the onshore pipeline-only segments (i.e., not adjacent to an access road) of the natural gas pipeline component includes a 150-foot-wide impact corridor to account for pipeline trenching, side-casting, and equipment operation/travel. The temporary construction footprint for offshore segments of the natural gas pipeline (i.e., lliamna Lake and Cook Inlet) varies (up to 183-foot maximum). ² Includes Quarry B and Quarry C; Quarry A is in the footprint of the bulk TSF. ³ Includes the onshore dredge material storage areas adjacent to the port facility.

⁴ Includes the tie-in to the compressor station.

⁵ Total length of pipeline. Includes lengths for segments that are co-located with the transportation corridor access road(s) that are not

 Isted under the natural gas pipeline section of the table.

 < = less than</td>
 -- = not applicable

 GIS = Geographic Information System
 HDD = horizontal directional drilling

 PLP = Pebble Limited Partnership
 TSF = tailings storage facility

K2.3.2Material Sites

Construction materials would be excavated from borrow material sites along the transportation corridor roads. Table K2-22 provides information for Alternative 2 material sites, including the estimated quantities, size, type of material, use of material and whether blasting is required. Table K2-23 provides information for Alternative 2—Newhalen River North Crossing Variant material sites. Figure K2-5 and Figure K2-6 show the location of material sites identified for Alternative 2.

Site	Quantity (cubic yards)	Size (acres) ¹	Туре	Blasting Required (Yes/No)	Use
		Port Acc	ess Road		
MS-D23	125,000	6	Rock	Yes	Road, Pipeline
MS-D24	351,000	25	Rock	Yes	Road, Pipeline
MS-D25	66,000	13	Gravel	No	Road, Pipeline
MS-D26	100,000	12	Gravel	No	Road, Pipeline
MS-D27	168,000	12	Rock	Yes	Road, Pipeline
MS-D28	102,000	13	Gravel and broken rock scree	No	Road, Pipeline
		Mine Acc	cess Road		
MS-T00	200,000	8	Gravel	No	Road, Pipeline
MS-T01	700,000	12	Rock and gravel	Yes	Road, Pipeline
MS-E06	400,000	28	Sand and gravel	Yes	Road, Pipeline
MS-E07	250,000	45	Gravel	No	Road, Pipeline
MS-E08	250,000	16	Gravel	No	Road, Pipeline
MS-E09	400,000	29	Gravel	No	Road, Pipeline
MS-E10	300,000	8	Gravel	No	Road, Pipeline
MS-E11	300,000	25	Gravel	No	Road, Pipeline
MS-E12	200,000	33	Gravel	No	Road, Pipeline
MS-E13	250,000	16	Gravel	No	Road, Pipeline
MS-E14	400,000	20	Gravel	No	Road, Pipeline
Transportation Component Total	4,562,000	321			
		Natural G	as Pipeline		
MS-PL-D01	50,000	4	Rock	Yes	Pipeline
MS-PL-D02	100,000	3	Gravel	No	Pipeline
MS-PL-D03	50,000	3	Rock	Yes	Pipeline
MS-D15	120,000	17	Gravel	No	Pipeline
MS-D16	263,000	21	Gravel	No	Pipeline
MS-D17	438,000	37	Gravel and sand	No	Pipeline
MS-D18	555,000	41	Gravel and sand	No	Pipeline
MS-D19	165,000	20	Gravel	No	Pipeline
MS-D20	360,000	35	Rock	Yes	Pipeline
MS-D21	216,000	41	Gravel	No	Pipeline
MS-D22	150,000	14	Gravel	No	Pipeline
MS-D31	210,000	39	Gravel	No	Pipeline
MS-D32	146,000	23	Gravel	No	Pipeline
Pipeline Component Total	2,823,000	298			
Alternative 2 Total	7,385,000	619			

Table K2-22: Alternative 2 Material Site (Quantities Estimates
--	----------------------

Notes:

¹ Represents area of permanent impacts. Numbers are approximate and rounded Source: Project GIS database

Table K2-23: Alternative 2—Newhalen River North Crossing Variant Material Site Quantities Estimates

Site	Quantity (cubic yards)	Size (acres) ¹	Туре	Blasting Required (Yes/No)	Use	
	Pc	ort Access	Road	,		
MS-D23	125,000	6	Rock	Yes	Road, Pipeline	
MS-D24	351,000	25	Rock	Yes	Road, Pipeline	
MS-D25	66,000	13	Gravel	No	Road, Pipeline	
MS-D26	100,000	12	Gravel	No	Road, Pipeline	
MS-D27	168,000	12	Rock	Yes	Road, Pipeline	
MS-D28	102,000	13	Gravel and broken rock scree	No	Road, Pipeline	
Mine Access Road						
MS-T00	200,000	8	Gravel	No	Road, Pipeline	
MS-T01	700,000	12	Rock and gravel	Yes	Road, Pipeline	
MS-E06	400,000	28	Sand and gravel	Yes	Road, Pipeline	
MS-E07	250,000	45	Gravel	No	Road, Pipeline	
MS-E08	250,000	16	Gravel	No	Road, Pipeline	
MS-E09	400,000	29	Gravel	No	Road, Pipeline	
MS-E10-ALT	300,000	25	Gravel	No	Road, Pipeline	
MS-E11	300,000	25	Gravel	No	Road, Pipeline	
MS-E12	200,000	33	Gravel	No	Road, Pipeline	
MS-E13	250,000	16	Gravel	No	Road, Pipeline	
MS-E14	400,000	20	Gravel	No	Road, Pipeline	
Transportation Component Total	4,562,000	338				
	Nat	ural Gas P	ipeline			
MS-PL-D01	50,000	4	Rock	Yes	Pipeline	
MS-PL-D02	100,000	3	Gravel	No	Pipeline	
MS-PL-D03	50,000	3	Rock	Yes	Pipeline	
MS-D15	120,000	17	Gravel	No	Pipeline	
MS-D16	263,000	21	Gravel	No	Pipeline	
MS-D17	438,000	37	Gravel and sand	No	Pipeline	
MS-D18	555,000	41	Gravel and sand	No	Pipeline	
MS-D19	165,000	20	Gravel	No	Pipeline	
MS-D20	360,000	35	Rock	Yes	Pipeline	
MS-D21	216,000	41	Gravel	No	Pipeline	
MS-D22	150,000	14	Gravel	No	Pipeline	
MS-D31	210,000	39	Gravel	No	Pipeline	
MS-D32	146,000	23	Gravel	No	Pipeline	
Pipeline Component Total	2,823,000	298				
Alternative 2 Total 7,385,000 636						

Notes:

¹Represents area of permanent impacts. Numbers are approximate and rounded Source: Project GIS database





Water extraction from sources along the transportation corridor and natural gas pipeline corridor would be necessary to support project construction and operations (Figure K2-5 and Figure K2-6). Table K2-24 provides information for Alternative 2 water extraction sites, including the waterbody type, use, years and season of use, and estimated extraction rate and volumes.

			Extra	action		
Water Extraction Site	All-Season (Yes/No)	Waterbody Type	Use	Years of Use	Rate (gpm)	Annual Volume (gal)
		F	Port Access Road			
WES-N05	Yes	Stream	Road and pipeline construction	Life of mine	500	3M
WES-N06	Yes	Stream	Road and pipeline construction	3	500	3M
WES-N07	Yes	Stream	Road and pipeline construction	3	500	ЗМ
WES-N08	Yes	Pond	Road and pipeline construction	Life of mine	500	5M
WES-N09	Yes	Stream	Road and pipeline construction	3	500	3M
WES-N10	Yes	River	Road and pipeline construction	Life of mine	1,000	8M
		N	line Access Road		•	•
WES-16	Yes	Stream	Construction and testing	Life of mine	500	1M
WES-17	Yes	Pond	Construction	3	500	1M
WES-18	Yes	Pond	Construction	3	500	1M
WES-E33	Yes	Lake	Road and pipeline construction	Life of mine	1,000	8M
WES-E34	Yes	Stream	Road and pipeline construction	3	500	3M
WES-N27	No	Stream	Road and pipeline construction	3	500	3M
WES-N28	Yes	Lake	Road and pipeline construction	3	500	3M
WES-N29	Yes	River	Road and pipeline construction	3	1,000	8M
WES-N30 ¹	Yes	River	Road and pipeline construction	Life of mine	1,000	5M
WES-N31	No	Stream	Road and pipeline construction	3	500	3M
WES-N32	Yes	Pond	Road and pipeline construction	3	500	3M
Transportation Co	mponent Total					64M

					Extra	ction	
Water Extraction Site	All-Season (Yes/No)	Waterbody Type	Use	Years of Use	Rate (gpm)	Annual Volume (gal)	
Natural Gas Pipeline ²							
WES-N11	No	Stream	Pipeline construction	3	500	3M	
WES-N12	Yes	Stream	Pipeline construction	3	500	3M	
WES-N13	Yes	River	Pipeline construction	3	1,000	8M	
WES-N14	Yes	Lake	Pipeline construction	3	500	3M	
WES-N15	No	Stream	Pipeline construction	3	500	3M	
WES-N16	No	Stream	Pipeline construction	3	500	3M	
WES-N17	No	Stream	Pipeline construction	3	500	3M	
WES-N18	No	Lake	Pipeline construction	3	500	3M	
WES-N19	No	Stream	Pipeline construction	3	500	3M	
WES-N20	Yes	Stream	Pipeline construction	3	1,000	8M	
WES-N21	No	Stream	Pipeline construction	3	500	3M	
WES-N22	Yes	Stream	Pipeline construction	3	1,000	3M	
WES-N23	Yes	Stream	Pipeline construction	3	1,000	5M	
WES-N24	Yes	Stream	Pipeline construction	3	500	3M	
WES-N25	Yes	Stream	Pipeline construction	3	500	3M	
WES-N26	Yes	Stream	Pipeline construction	3	500	3M	
WES-P01	Yes	Stream	Pipeline construction and testing	1	500	3M	
WES-P02	Yes	Stream	Pipeline construction	1	500	1M	
WES-P03	Yes	Stream	Pipeline construction and testing	1	500	3M	
WES-P04	No	Stream	Pipeline construction	1	500	1M	
Pipeline Compone	ent Total					68M	
				Alterna	tive 2 Total	132M	

Table K2-24: Alternative 2 Water Extraction Site Quantity	y Estimates
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Notes:

¹ For the Alternative 2—Newhalen River North Crossing Variant, this water extraction site is in a different location (i.e., different location, same water extraction site name).

² Includes water extraction sites along pipeline-only portions of the natural gas pipeline corridor (i.e., not adjacent to transportation corridor access roads).

gal = gallons

gpm = gallons per minute

M = million

Source: Project GIS database

K2.3.3Access Roads to Water Extraction Sites

All season gravel roads would be necessary to access some of the water extraction sites proposed for Alternative 2 (Figure K2-5 and Figure K2-6). Table K2-25 provides details on the location and approximate length and acreage of each planned access road.

Table K2-25: Alternative 2 Water Extraction Site Access Roads

Name	Nearest Mile Post	Length (miles)	Permanent Footprint (acres) ¹	Temporary Construction Footprint (acres)
AWES-N28	MAR MP-11	<1		<1
AWES-N32	MAR MP-24	<1		<1
Alternative 2 Total		<1		<1

Notes:

¹ Represents area of permanent impacts. Numbers are approximate and rounded.

< = less than

-- = not applicable

Source: Project GIS database

K2.4 ALTERNATIVE 3—NORTH ROAD ONLY

K2.4.1 Alternative 3 Project Components Footprints

Table K2-26 provides a summary of the Alternative 3—North Road Only project footprint for each of the four project components (mine site, transportation corridor, port, and natural gas pipeline) described in Chapter 2, Alternatives, of the EIS. Table K2-27 summarizes the difference in footprints for the variant analyzed under Alternative 3. Brackets around a number indicate a change between the variant and the base case Alternative 3.

Project Component	Facility	Permanent Footprint (acres)	Temporary Construction Footprint (acres) ¹	Length (miles)
	Open Pit	609		
	Sediment/Seepage Collection Systems	360		
	Bulk Tailings Storage Facility	2,797		
	Pyritic Tailings Storage Facility	1,000		
	Stockpiles	527		
	Quarries ²	860		
Mino Sito	Onsite Access Roads	860		39
Willie Site	Mineral Processing Facilities	113		
	Mill Site Power Plant	22		
	Mine Site Infrastructure	139		
	Water Management Ponds	1,066		
	Waste Management Facilities	17		
	Water Treatment Plants	19	<1	
	Mine Site Total	8,390	<1	39

Table K2-26: Alternative 3 Project Footprint

Project Component	Facility	Permanent Footprint (acres)	Temporary Construction Footprint (acres) ¹	Length (miles)
	Iliamna Spur Road			
	Explosive Storage Spur Road	4	2	<1
	Mine Access Road			
	Kokhanok Spur Road			
	Pedro Bay Airport Spur Road	6	3	<1
	Port Access Road			
T	North Access Road	1,077	650	82
Transportation	Water Extraction Pads and Access Roads		<1	<1
Cornaoi	Material Sites	604		
	North Ferry Terminal			
	South Ferry Terminal			
	Kokhanok East Ferry Terminal			
	Eagle Bay Ferry Terminal			
	Pile Bay Ferry Terminal			
	Transportation Corridor Total	1,691	655	82
	Amakdedori Port			
	Amakdedori Port Airstrip			
	Diamond Point Port ³	35	16	
Port	Diamond Point Port Dredging Area		76	
	Water Extraction Pads and Access Roads			
	Lightering Location – Mooring Buoys and Anchors	<1		
	Port Total	36	92	
	Compressor Station Pad ⁴	2		<1
	HDD Pullback Work Area		<1	
	Onshore Pipeline-Only Pipeline Corridor Segments		124	8
Natural Gas	Material Sites	11		
Pipeline	Pipeline Construction Access Roads			
	Cook Inlet Segment		569	75
	Cottonwood Bay Segment		69	3
	Iliamna Lake Segment			
	Natural Gas Pipeline Total	13	762	164 ⁵
	Alternative 3 Total	10,130	1,510	

Table K2-26: Alternative 3 Project Footprint

Notes:

Footprints are based on project GIS database. Numbers are rounded to the nearest whole number; therefore, the sum of individual facilities may not match the totals listed for the overall component.

¹ The temporary construction footprint for the transportation corridor and port components includes a 30-foot buffer around the permanent footprint where temporary construction-related activities would occur; except for water extraction site access roads, which include a 5-foot buffer. The temporary construction footprint for the onshore pipeline-only segments (i.e., not adjacent to an access road) of the natural gas pipeline component includes a 150-foot-wide impact corridor to account for pipeline trenching, side-casting, and equipment operation/travel. The temporary construction footprint for offshore segments of the natural gas pipeline (i.e., Iliamna Lake and Cook Inlet) varies (up to 175-foot maximum). ² Includes Quarry B and Quarry C; Quarry A is in the footprint of the bulk TSF.

³ Includes the initial dredge material stockpile north of the port. The maintenance dredge material stockpile would be located in a material site for the transportation corridor.

⁴ Includes the tie-in to the compressor station.

⁵ Total length of pipeline. Includes lengths for segments that are co-located with the transportation corridor access road(s) that are not listed under the natural gas pipeline section of the table.

< = less than

-- = not applicable

GIS = Geographic Information System

HDD = horizontal directional drilling

PLP = Pebble Limited Partnership

TSF = tailings storage facility

Project Component	Facility	Permanent Footprint (acres)	Temporary Construction Footprint (acres) ¹	Length (miles)		
	Open Pit	609				
	Sediment/Seepage Collection Systems	360				
	Bulk Tailings Storage Facility	2,797				
	Pyritic Tailings Storage Facility	1,000				
	Stockpiles	527				
		860				
Mine Site	Onsite Access Roads	860		39		
	Mineral Processing Facilities	114				
	Mill Site Power Plant	22				
	Mine Site Infrastructure	139				
	Water Management Ponds	1,066				
	Waste Management Facilities	17				
	Water Treatment Plants	19	<			
	Willie Site Total	[0,391]	<u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	39		
	Illamna Spur Road					
	Explosive Storage Spur Road					
	Mine Access Road					
	Roknanok Spur Road					
	Peulo Bay Alipoit Spul Road		from Altornativa 2 Transportation			
	North Access Road	No obongo fra				
Transportation	Wrater Extraction Pade and Access Poads					
Corridor	Material Sites					
	North Form Torminal					
	South Enry Terminal					
	Kokhanok Fast Forny Torminal	-				
	Fade Bay Ferry Terminal					
	Pile Bay Ferry Terminal					
	Transportation Corridor Total	1 691	655	82		
	Amakdedori Port	1,001	000	02		
	Amakdedori Port Airstrin					
	Diamond Point Port ⁴	[36]	16			
Port	Diamond Point Port Dredging Area		76			
	Water Extraction Pads and Access Roads					
	Lightering Location – Mooring Buovs and Anchors	<1				
	Port Total	36	92			
	Compressor Station Pad ⁵					
	HDD Pullback Work Area					
	Onshore Pineline-Only Pineline Corridor Segments					
	Material Sites	No change f	rom Alternative 3 Nat	ural Gas		
Natural Gas	Pineline Construction Access Roads		Pipeline Corridor			
Pipeline	Cook Inlet Segment					
	Cottonwood Bay Segment	1				
	Iliamna Lake Segment	1				
	Natural Gas Pinolino Total	13	769	1646		
	Alternative 3_Concentrate Dipoline Variant Total	[10 132]	1 509			
Notos:	Alternative 5-0010entrate ripenne Vallant Total	[10,132]	1,000			

Table K2-27: Alternative 3—Concentrate Pipeline Variant Project Footprint

Footprints are based on project GIS database. Numbers are rounded to the nearest whole number; therefore, the sum of individual facilities may not match the totals listed for the overall component.

¹ The temporary construction footprint for the transportation corridor and port components includes a 30-foot buffer around the permanent footprint where temporary construction-related activities would occur; except for water extraction site access roads, which include a 5-foot buffer. The temporary construction footprint for the onshore pipeline-only segments (i.e., not adjacent to an access road) of the natural gas pipeline component includes a 150-foot-wide impact corridor to account for pipeline trenching, side-casting, and equipment operation/travel. The temporary construction footprint for offshore segments of the natural gas pipeline (i.e., Iliamna ² Includes Quarry B and Quarry C; Quarry A is in the footprint of the bulk TSF.

³ The concentrate pipeline (and the optional return water pipeline) would be co-located in a single trench with the gas pipeline at the toe of the north road corridor embankment. The Alternative 3 base-case road width was conceptually engineered to accommodate

⁴ Includes the initial dredge material stockpile north of the port. The maintenance dredge material stockpile would be located in a material site for the transportation corridor. ⁵ Includes the tie-in to the compressor station.

⁶ Total length of pipeline. Includes lengths for segments that are co-located with the transportation corridor access road(s) that are not listed under the natural gas pipeline section of the table.

< = less than PLP = Pebble Limited Partnership

K2.4.2Material Sites

Construction materials would be excavated from borrow material sites along the transportation corridor roads. Table K2-28 provides information for Alternative 3 material sites, including the estimated quantities, size, type of material, use of material, and whether blasting is required. Figure K2-7 shows the location of material sites identified for Alternative 3.

Site	Quantity (cubic yards)	Size (acres) ¹	Туре	Blasting Required (Yes/No)	Use	
North Access Road						
MS-E06	400,000	28	Sand and gravel	Yes	Road, Pipeline	
MS-E07	250,000	45	Gravel	No	Road, Pipeline	
MS-E08	250,000	16	Gravel	No	Road, Pipeline	
MS-E09	400,000	27	Gravel	No	Road, Pipeline	
MS-E10	300,000	6	Gravel	No	Road, Pipeline	
MS-E11	300,000	25	Gravel	No	Road, Pipeline	
MS-E12	200,000	33	Gravel	No	Road, Pipeline	
MS-E13	250,000	16	Gravel	No	Road, Pipeline	
MS-E14	400,000	20	Gravel	No	Road, Pipeline	
MS-D15	120,000	19	Gravel	No	Road, Pipeline	
MS-D16	263,000	21	Gravel	No	Road, Pipeline	
MS-D17	438,000	37	Gravel and sand	No	Road, Pipeline	
MS-D18	500,000	41	Gravel and sand	No	Road, Pipeline	
MS-D19	165,000	21	Gravel	No	Road, Pipeline	
MS-D20	360,000	35	Rock	Yes	Road, Pipeline	
MS-D21	216,000	36	Gravel	No	Road, Pipeline	
MS-D22	150,000	12	Gravel	No	Road, Pipeline	
MS-D23	125,000	6	Rock	Yes	Road, Pipeline	
MS-D24	351,000	25	Rock	Yes	Road, Pipeline	
MS-D25	100,000	8	Gravel	No	Road, Pipeline	
MS-D26	100,000	12	Gravel	No	Road, Pipeline	
MS-D27	168,000	12	Rock	Yes	Road, Pipeline	
MS-D28	102,000	13	Gravel and broken rock scree	No	Road, Pipeline	
MS-D31	210,000	45	Gravel	No	Road, Pipeline	
MS-D32	146,000	24	Gravel	No	Road, Pipeline	
MS-T00	200,000	7	Gravel	No	Road, Pipeline	
MS-T01	700,000	12	Rock and gravel	Yes	Road, Pipeline	
Transportation Component Total	7,164,000	604				
		Na	atural Gas Pipeline			
MS-PL-D01	50,000	4	Rock	Yes	Pipeline	
MS-PL-D02	100,000	3	Gravel	No	Pipeline	
MS-PL-D03	50,000	3	Rock	Yes	Pipeline	
Pipeline Component Total	200,000	11				
Alternative 3 Total	7,364,000	615				

Table K2-28: Alternative 3 Material Site Quantities Estimates

Notes: ¹ Represents area of permanent impacts. Numbers are approximate and rounded. Source: Project GIS database



K2.4.3Water Extraction Sites

Water extraction from sources along the transportation corridor would be necessary to support project construction and operations (Figure K2-7). Table K2-29 provides information for Alternative 3 water extraction sites, including the waterbody type, use, years and season of use, and estimated extraction rate and volumes.

	A 11				Extraction			
Water Extraction Site	Season (Yes/No)	Waterbody Type	Use	Years of Use	Rate (gpm)	Annual Volume (gal)		
	North Access Road							
WES-16	Yes	Stream	Construction and testing	Life of mine	500	1M		
WES-17	Yes	Pond	Construction	3	500	1M		
WES-18	Yes	Pond	Construction	3	500	1M		
WES-N05	Yes	Stream	Road and pipeline construction	Life of mine	500	3M		
WES-N06	Yes	Stream	Road and pipeline construction	3	500	3M		
WES-N07	Yes	Stream	Road and pipeline construction	3	500	3M		
WES-N08	Yes	Pond	Road and pipeline construction	Life of mine	500	5M		
WES-N09	Yes	Stream	Road and pipeline 3		500	3M		
WES-N10	Yes	River	Road and pipeline construction	Life of mine	1,000	8M		
WES-N11	No	Stream	Road and pipeline construction	3	500	3M		
WES-N12	Yes	Stream	Road and pipeline construction	Life of mine	500	3M		
WES-N13	Yes	River	Road and pipeline construction	3	1,000	8M		
WES-N14	Yes	Lake	Road and pipeline construction	Life of mine	500	3M		
WES-N15	No	Stream	Road and pipeline construction	3	500	3M		
WES-N16	No	Stream	Road and pipeline construction	3	500	3M		
WES-N17	No	Stream	Road and pipeline construction	3	500	3M		
WES-N18	No	Lake	Road and pipeline construction	3	500	3M		
WES-N19	No	Stream	Road and pipeline construction	3	500	3M		
WES-N20	Yes	Stream	Road and pipeline construction	Life of mine	1,000	8M		

Table K2-29: Alternative 3 Water Extraction Site Quantity Estimates

	A 11			Extraction		
Water Extraction Site	Season (Yes/No)	Waterbody Type	Use	Years of Use	Rate (gpm)	Annual Volume (gal)
WES-N21	No	Stream	Road and pipeline construction	3	500	3M
WES-N22	Yes	Stream	Road and pipeline construction	Life of mine	1,000	3M
WES-N23	Yes	Stream	Road and pipeline construction	3	1,000	5M
WES-N24	Yes	Stream	Road and pipeline construction	3	500	3M
WES-N25	Yes	Stream	Road and pipeline construction	3	500	3M
WES-N26	Yes	Stream	Road and pipeline construction	3	500	3M
WES-N27	No	Stream	Road and pipeline 3		500	3M
WES-N28	Yes	Lake	Road and pipeline 3		500	3M
WES-N29	Yes	River	Road and pipeline construction	Life of mine	1,000	8M
WES-N30	Yes	River	Road and pipeline construction	3	1,000	5M
WES-N31	No	Stream	Road and pipeline construction	Road and pipeline 3 500		3M
WES-N32	Yes	Pond	Road and pipeline construction	3	500	3M
Transportation Component Total					113M	
		Ν	latural Gas Pipeline ¹	I		
WES-P01	Yes	Stream	Pipeline construction and testing1500		500	3M
WES-P02	Yes	Stream	Pipeline construction 1 500		500	1M
WES-P03	Yes	Stream	Pipeline construction and testing 1 500		500	3M
WES-P04	No	Stream	Pipeline construction	1	500	1M
Pipeline Component Total						8M
Alternative 3 Total						

Table K2-29: Alternative 3	Water	Extraction	Site	Quantity	Estimates
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Notes:

Notes: ¹Includes water extraction sites along pipeline-only portions of the natural gas pipeline corridor (i.e., not adjacent to transportation corridor access roads). gal = gallons gpm = gallons per minute M = Millions Source: Project GIS database

K2.4.4Access Roads to Water Extraction Sites

All-season gravel roads would be necessary to access some of the water extraction sites proposed for Alternative 3 (Figure K2-7). These access roads would be the same as presented in Table K2-25 for Alternative 2.