

**RFI 012
Pebble Project EIS**

Request for Information

Title/Subject:	Air Quality Related Values
Requestor:	Caitlin Shaw, AECOM
Date Transmitted:	4/26/2018
Recipient:	Pebble EIS Proponent
Response Requested by:	5/24/2018
Rationale:	Results from the Air Quality Related Values (visibility and deposition) analyses from project activities should be disclosed within the EIS. Some project components will require an air permit and associated impact analysis under ADEC and EPA regulations. The results of these analyses are necessary to evaluate impacts to air quality in the EIS.
Describe the Information Requested and Level of Detail:	Provide results of Air Quality Related Values (visibility and atmospheric acidic deposition) analysis of mine site and compressor station impacts on Class I areas or sensitive Class II areas.

Recipient Response Form

Date Received from USACE:	April 26, 2018
Response from Recipient (Describe Information Requested to the Level of Detail Requested; Provide Attachments as Needed):	<p>The attached response document contains a visibility analysis for the operation of the mine facilities, Amakdedori Port, and Kenai natural gas pipeline compressor station on nearby Federal Class I and Class II areas.</p> <p>An evaluation of the atmospheric acidic deposition for the facilities was not conducted as natural gas will be the primary fuel for electrical generation with ultra-low sulfur diesel (ULSD)-fueled engines as backup in the event the pipeline was shut down. Diesel-engine powered equipment at the mine facilities will also be fueled with ultra-low sulfur diesel.</p> <p>Deposition information for the mine site will be described in the response to RFI 009.</p>
List Number and Type of Response Attachments:	One Attachment: Response to Request for Information 12, Air Quality Related Values
Date Returned to USACE:	7/31/2018

AECOM Intake Form

Date Response was Received:	7/31/2018
Received by:	Bill Craig, AECOM
Describe any Follow-up Related to this RFI:	None

Pebble Project – Response to Request for Information 012

Air Quality Related Values

Air Quality Related Values (AQRVs) screening analyses were prepared for the following project components: Mine Site, Amakdedori Port, and Kenai Compressor Station. Because the Mine Site would have the potential to trigger Prevention of Significant Deterioration (PSD) permitting, and consistent with the response to RFI 007, the visibility, ambient ozone, and deposition impacts are addressed for the Mine Site regardless of the screening analysis results.

AQRV is generally defined in the Federal Register (45 Federal Register (FR) 43003, June 25, 1980) as a resource that could be adversely affected by a change in air quality. Those resources may include visibility, flora, fauna, odor, water, soils, geologic features, and cultural resources. The U.S. Forest Service, National Park Service, and U.S. Fish and Wildlife Service, collectively the Federal Land Managers (FLM), published a revised definition of an AQRV. This definition is:

“A resource, as identified by the FLM for one or more Federal areas that may be adversely affected by a change in air quality. The resource may include visibility or a specific scenic, cultural, physical, biological, ecological or recreational resource identified by the FLM for a particular area.” (Federal Land Managers’ Air Quality Related Values Work Group (FLAG) Phase I Report – Revised (2010)).

This document, commonly called FLAG 2010, provides guidance that may be used for addressing AQRV reviews. As stated in FLAG 2010, “the FLAG report is guidance and reflects agency direction, but is not a rule.”

Changes in air quality levels can result from new or modified sources of the emissions of regulated air pollutants. The Mine Site, Amakdedori Port, and Kenai Compressor Station, would each include new air pollutant emissions to the atmosphere. As a result, an analysis of the potential to affect AQRVs in federally protected areas is required.

Per 18 Alaska Administrative Code (ACC) 50.015(c)(2), Table 1, one federally protected PSD Class I area is located in the general vicinity of the Mine Site, Amakdedori Port, and/or Kenai Compressor Station. A second PSD Class I area, while not in the general vicinity, was included consistent with other AQRV reviews that have been prepared for stationary sources located on the Kenai Peninsula. These two areas are Tuxedni National Wildlife Refuge designated as a National Wilderness Area (Tuxedni) and Denali National Park including the Denali Wilderness but excluding the Denali National Preserve (Denali). Other National Parks and National Wildlife Refuges of interest and located in the general vicinity of the Mine Site, Amakdedori Port, and/or Kenai Compressor Station are PSD Class II areas. These areas include Katmai National Park and Preserve, Lake Clark National Park and Preserve, Alagnak National Scenic River, Togiak National Wildlife Refuge, Kenai Fjords National Park, Kenai National Wildlife Refuge, and Alaska Maritime National Wildlife Refuge.

The distances between the National Parks and National Wildlife Refuges and the Mine Site, Amakdedori Port, and Kenai Compressor Station are provided in Table 1.1. As a screening tool, the FLMs have determined that an emission/distance metric can be applied to a source of new air pollutant emissions to determine whether AQRVs within a particular Class I or Class II area will be affected.

Table 1.1. Shortest Distance Between the Mine Site, Amakdedori Port, and Kenai Compressor Station and Certain National Parks and National Wildlife Refuges

National Park or National Wildlife Refuge	Shortest Distance from Mine Site	Shortest Distance from Amakdedori Port	Shortest Distance from Kenai Compressor Station
PSD Class I Areas			
Tuxedni	152.9 km NE	125.5 km NE	53.1 km NW
Denali	310.0 km NE	350.0 km NE	275.0 km N
Federal PSD Class II Areas			
Lake Clark National Park and Preserve	27.4 km E	69.2 km N	48.3 km W
Katmai National Park and Preserve	69.2 km S	32.2 km W	136.8 km SW
Alagnak Wild and Scenic River	104.6 km SW	90.1 km SW	225.3 km SW
Togiak National Wildlife Refuge	209.2 km SW	254.2 km W	391.0 km W
Kenai Fjords National Park	246.2 km E	180.2 km E	61.1 km E
Kenai National Wildlife Refuge	226.9 km E	173.8 km E	41.8 km E
Alaska Maritime National Wildlife Refuge – Augustine Island	114.2 km SE	33.8 km E	99.8 km SW

The emission/distance metric is based the total annual emissions in tons per year of a regulated air pollutant emitted as nitrogen oxides (NO_x), particulate matter (PM), and sulfur dioxide (SO₂) by the distance from the new source to the nearest boundary of the Class I or Class II area. If that ratio is less than 10, then the FLMs have determined that negative impacts to AQRVs would be negligible.

The total potential NO_x, PM, and SO₂ emissions from the Mine Site, Amakdedori Port, and Kenai Compressor Station are provided in Table 1.2. The emissions from only point sources are included because fugitive emissions are unlikely to travel long distances given the significant terrain variations in the vicinity of the Mine Site, Amakdedori Port, and Kenai Compressor Station.

Tables 1.3 through 1.5 provide the calculation of the emissions (Q) over distance (D) ratio for the Mine Site, Amakdedori Port, and Kenai Compressor Station, respectively. The Q/D values for each project component and the PSD Class I and Federal PSD Class II areas are less than 10. As a result, AQRVs would not likely to be affected at any of the PSD Class I or Federal PSD Class II areas.

Table 1.2. AQRV Potential Emissions

Project Component	Annualized Potential Emissions (tpy)			
	NO _x	PM ₁₀	SO ₂	Total
Mine Site	82.9	158.5	8.0	249.4
Amakdedori Port	53.8	4.0	0.3	58.1
Kenai Compressor Station	69.3	1.4	0.2	70.9

Table 1.3. Q/D Analysis for Mine Site

National Park or National Wildlife Refuge	Total Potential Emissions (tpy)	Closest Distance (km)	Q/D (tons/km)	Q/D ≥ 10?
PSD Class I Areas				
Tuxedni	249.4	152.9	1.63	No
Denali	249.4	310.0	0.80	No
Federal PSD Class II Areas				
Lake Clark National Park and Preserve	249.4	27.4	9.10	No
Katmai National Park and Preserve	249.4	69.2	3.60	No
Alagnak Wild and Scenic River	249.4	104.6	2.38	No
Togiak National Wildlife Refuge	249.4	209.2	1.19	No
Kenai Fjords National Park	249.4	246.2	1.01	No
Kenai National Wildlife Refuge	249.4	226.9	1.10	No
Alaska Maritime National Wildlife Refuge – Augustine Island	249.4	114.2	2.18	No

Table 1.4. Q/D Analysis for Amakdedori Port

National Park or National Wildlife Refuge	Total Potential Emissions (tpy)	Closest Distance (km)	Q/D (tons/km)	Q/D ≥ 10?
PSD Class I Areas				
Tuxedni	58.1	125.5	0.46	No
Denali	58.1	350.0	0.17	No
Federal PSD Class II Areas				
Lake Clark National Park and Preserve	58.1	69.2	0.84	No
Katmai National Park and Preserve	58.1	32.2	1.80	No
Alagnak Wild and Scenic River	58.1	90.1	0.64	No
Togiak National Wildlife Refuge	58.1	254.2	0.23	No
Kenai Fjords National Park	58.1	180.2	0.32	No
Kenai National Wildlife Refuge	58.1	173.8	0.33	No
Alaska Maritime National Wildlife Refuge – Augustine Island	58.1	33.8	1.72	No

Table 1.5. Q/D Analysis for Kenai Compressor Station

National Park or National Wildlife Refuge	Total Potential Emissions (tpy)	Closest Distance (km)	Q/D (tons/km)	Q/D ≥ 10?
PSD Class I Areas				
Tuxedni	70.9	53.1	1.34	No
Denali	70.9	275.0	0.26	No
Federal PSD Class II Areas				
Lake Clark National Park and Preserve	70.9	48.3	1.47	No
Katmai National Park and Preserve	70.9	136.8	0.52	No
Alagnak Wild and Scenic River	70.9	225.3	0.31	No
Togiak National Wildlife Refuge	70.9	391.0	0.18	No
Kenai Fjords National Park	70.9	61.1	1.16	No
Kenai National Wildlife Refuge	70.9	41.8	1.70	No
Alaska Maritime National Wildlife Refuge – Augustine Island	70.9	99.8	0.71	No

Irrespective of the Q/D analyses determining that AQRVs would not likely to be affected in any National Park and National Refuge, additional analyses were prepared to address the potential for the Mine Site to cause visibility impacts, ambient ozone impacts, and deposition at National Park and National Wildlife Refuge Class I areas. The analyses are discussed below.

Visibility Impacts

The Plume Visual Impact Screening Model (VISCREEN) was used to determine whether air pollutant emissions from the Mine Site would cause visibility impacts at a PSD Class I area located in the general vicinity of the Mine Site.

The VISCREEN model uses the annual emissions of particulate matter 10 micrometers or less in diameter (PM₁₀) and NO_x (as nitrogen dioxide (NO₂)) to calculate potential impacts to visibility. Other model inputs include the distances from the source to the area of interest and the background visual range. A background visual range of 195 kilometer (km) was used in each of the VISCREEN model runs as representative of this area of Alaska. The 195 km range is the value provided by the FLMs for Tuxedni.

The VISCREEN inputs and model results for the Mine Site is provided in Table 1.6. The inputs include the annual emissions of PM₁₀ of 158.5 tpy and NO_x (as NO₂) of 82.9 tpy. As shown in Table 1.6, the combination of inputs, distances modeled, and conservative model assumptions demonstrates that the visibility criteria established for PSD Class I areas would not be exceeded at any Class I area.

Table 1.6. Mine Site VISCREEN Analysis Summary – PSD Class I Areas

Background	Theta	Azi	Distance	Alpha	Delta E		Contrast	
					Crit.	Plume	Crit.	Plume
Tuxedni National Wildlife Refuge – 152.9 km Distance								
SKY	10	84	152.9	84	2	0.376	0.05	0.007
SKY	140	84	152.9	84	2	0.072	0.05	-0.003
TERRAIN	10	84	152.9	84	2	0.370	0.05	0.004
TERRAIN	140	84	152.9	84	2	0.041	0.05	0.001
Denali National Park – 310 km Distance								
SKY	10	84	310	84	2	0.203	0.05	0.003
SKY	140	84	310	84	2	0.031	0.05	-0.001
TERRAIN	10	84	310	84	2	0.089	0.05	0.001
TERRAIN	140	84	310	84	2	0.013	0.05	0.000

Ambient Ozone Analysis

Ozone (O₃) is not emitted directly and is created by chemical reactions between NO_x and volatile organic compounds (VOC) in the presence of sunlight and heat. Although sunshine is present in the project area most days, temperatures remain relatively low which would minimize the production of O₃. The form of the O₃ National and Alaska Ambient Air Quality Standards (NAAQS/AAAQS) is the annual fourth highest daily maximum 8-hour average concentration, averaged over three years, is not to exceed 0.070 parts per million (ppm). The Mine Site would not be located in an O₃ non-attainment area or an O₃ maintenance area. The Mine Site would have very few sources of natural and anthropogenic O₃. Because the Mine Site potentials to emit NO_x and VOC would be low and because no other significant sources of those air pollutants would exist in the area, Mine Site air pollutant emissions would not result in adverse O₃ impacts at National Park or National Wildlife Refuge PSD Class I area.

Deposition Impacts

Deposition impacts due to air pollutant emissions that would be released from the Mine Site were evaluated and discussed in the response to RFI 009. This analysis demonstrated no adverse impacts due to deposition would occur within 10 km of the Mine Site. The PSD Class I areas are a distance of approximately 150 km to 310 km from the Mine Site. Given that deposition decreases as distance increases, the deposition modeling included in the response to RFI 009 provides reasonable assurance that no adverse impacts due to deposition would occur in those areas.