

## K3.1 INTRODUCTION TO AFFECTED ENVIRONMENT

Information about traditional ecological knowledge (TEK) and the approach taken by the US Army Corps of Engineers (USACE) to collect TEK is outlined in Section 3.1, Introduction to Affected Environment. The information collected is below.

### K3.1.1 Scoping Comments

Scoping comments were pulled from the Scoping Report (Appendix A). Comments received that pertain to the topics listed in Section 3.1, Introduction to Affected Environment, are listed below.

- Fish
  - The area that makes up the headwaters is full of underwater streams in which small fry/fingerlings swim as they emerge. They sometimes swim into lakes and ponds of the region and often get too big to get out; they are called landlocked salmon.
  - Many species of fish are used for subsistence harvest, not just salmon.
  - The people in Seldovia have a long tradition of subsistence fishing for herring in Kamishak Bay. The herring also support other animals that we subsist on.
  - The placement of the tailings impoundment facility located on the North Fork of the Kaktuli River is prime king salmon habitat.
- Wildlife
  - Exploration activities at the site have caused caribou to avoid the area.
  - Helicopter traffic during exploration disrupted subsistence activities. Particularly, helicopter traffic impacts spring waterfowl hunting (geese), displaces caribou, and impacts the Kaktuli River.
- Birds
  - Kamishak Bay is home to a large seabird nesting colony.
  - Bald eagles nest and feed along the coast and along all of the major salmon spawning rivers in the Bristol Bay and Cook Inlet regions, with a relatively high number of golden eagles also found here.
- Marine Mammals
  - Incorporate traditional knowledge on freshwater seals in Iliamna Lake, and be aware that there is a Freshwater Seal Commission.
  - The proposed ferry could strike seals in Iliamna Lake, which would congregate in the open water created by the icebreaking ferry.
- Vegetation
  - Over 80 edible and medicinal plants grow and are harvested in the project area including several species of berries, wild peas, wild onions, ferns, cow parsnip, rosehips, and many others.
- Subsistence activity
  - Be sure to include Kodiak Island to your analysis, as it has important subsistence areas that could be impacted by the project.
  - The road corridor would go through winter moose hunting area in the Talarik Creek watershed.
  - The Nushagak, Mulchatna, and Kaktuli watersheds are the hunting and fishing areas for people of New Stuyahok.

- The Amakdedori area has been historically used for early subsistence activities, including salmon harvest.
- The mountain behind Nondalton is traditional subsistence area.
- The Frying Pan Lake area is important to Nondalton people and shared with other neighboring people.
- The people in Seldovia have a long tradition of subsistence fishing for herring in Kamishak Bay. The herring also support other animals that we subsist on.
- The residents along Iliamna Lake rely on access to small islands for the harvest of bird eggs in the spring.
- A chart on the Bristol Bay seasonal subsistence gathering cycle was submitted.
- Culturally important areas
  - The Amakdedori port area has been used as a site for a cultural camp, subsistence use areas, and school field trips.
  - There are ancestral burial grounds at/near the proposed Amakdedori port, along the road route on the south side of Iliamna Lake, and on the road route to the south ferry dock.
  - This region of Alaska contains several recorded rock art (petroglyph) sites. No doubt more such sites remain to be discovered. Many of the rock art panels are on shorelines and only visible during low tide; thus, it is easy for archaeological surveys to miss these important cultural resources.
- Navigation
  - While lower Cook Inlet and Kamishak Bay do not have ice or currents to the same extent as the upper Cook Inlet, Lower Cook Inlet is not nearly as protected as the waters of upper Cook Inlet, and Kamishak Bay experiences challenging winter sea conditions.
  - No depths are recorded on navigation charts for Iliamna Lake. Some rocks on the chart do not exist; others are not where the charts show them to be. Some are not on the charts at all. There are places where the depth goes from 400 feet to 30 feet.
  - The wind has pushed ice on the north shore of Iliamna Lake in piles as high as 50 feet and could damage the proposed ferry terminal.
  - The east winds on Iliamna Lake are strong and generate large waves that would make the proposed ferry unreliable and dangerous; winds can reach 100 miles per hour.
  - A disabled ferry could be blown by the wind onto the shoreline such as at Eagle Bluffs.

Scoping comments that referenced a geographic location via the online comment form web mapping feature are below.

- Culturally important areas

**Applicable Comment**

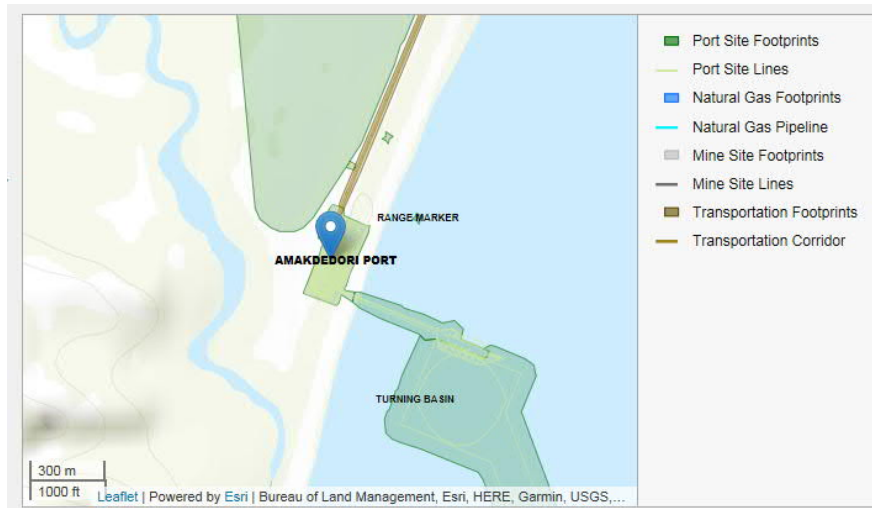
The proposed dredge storage and port site on this map is overlaid on the Amakdedori Native Village. This is also the site of cultural learning camps, subsistence use areas, and school field trips.

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Survey work needs to include consultation with local tribal governments to apply religious and culturally appropriate research methods. Any alternatives will need to address meaningful mitigation to the loss of access to historical cultural resource sites and to living cultural resource sites.

Loss of access and location changes to the traditional learning camps and school field trips to the Amakdedori Native Village will need to be made in consultation with the Kokhanok school and parents. Alternative locations for these teachings would need to include other cultural sites of the Kachemak Tradition.

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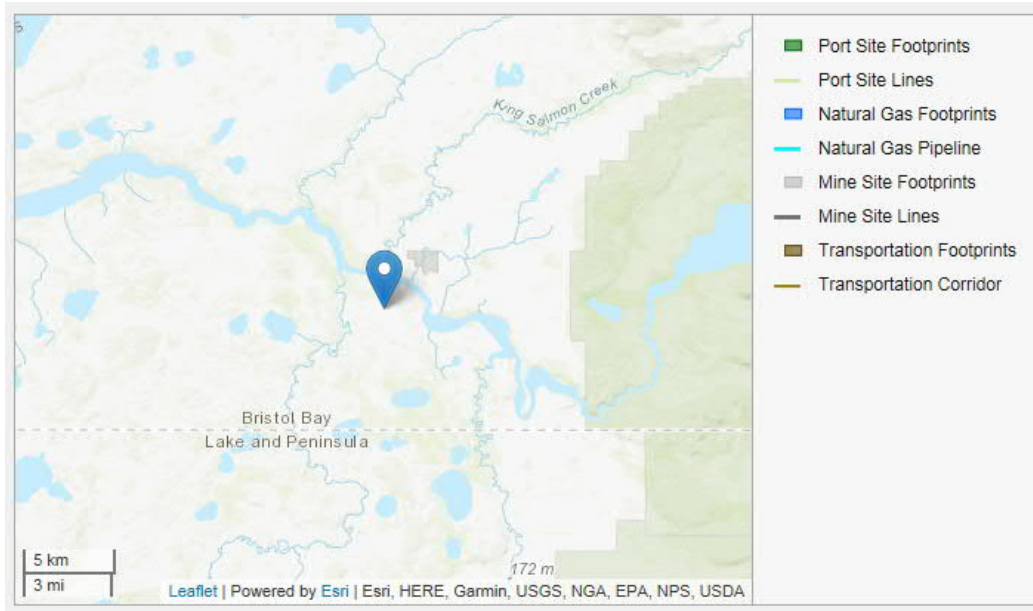


- Subsistence Activity

**Applicable Comment**

It worries me that the mine could impact animals, fish and berries that my friends and I gather for subsistence. A lot of us depend on the land and water for food. It offsets the high cost of living and shipping food into the area. We rely on moose, caribou, bear, many berries etc.

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- Subsistence Activity

<b>Applicable Comment</b>	
<p>My husband and I have a setnet site on Raspberry Island. We are especially concerned about transport plans across Lake Clark and Cook Inlet. We learned during the Exxon oil spill the spills in one place can impact fisheries and habitats along a wide swath. Although the spill was in Prince William Sound we found oil on our beaches in the Kodiak District and our fisheries was shut down.</p>	

### K3.1.2 Existing Documents

#### K3.1.2.1 Environmental Baseline Document

The Environmental Baseline Document (EBD) Chapter 23, Subsistence, contains the detailed results of a study done by Stephen R. Braund & Associates (SRB&A) in coordination with the Alaska Department of Fish and Game (ADF&G) (SRB&A 2011b). Two major elements of this study were to survey residents, and then follow up with interviews. The data (e.g., tables, charts, and maps) used to determine the environmental baseline for Section 3.9, Subsistence in this Environmental Impact Statement (EIS) reflect the findings of this study. In this way, TEK regarding areas of subsistence use and harvest data are incorporated, and would be reflected in pertinent EIS chapters.

#### K3.1.2.2 EPA Watershed Study

Appendix D in Volume 2 of the EPA *Assessment of Potential Mining Impacts on Salmon Ecosystems of Bristol Bay, Alaska* is a study of TEK and cultural characterization in the Nushagak and Kvichak watersheds, conducted by Boraas and Knott (Boraas et al. 2013). The study was based on interviews in the region. Information from this study that would be considered TEK and pertains to the topics presented in listed in Section 3.1 is listed below.

- Fish
  - That is spring water [at Kijik]. It does not freeze. That is why you can go over there and get a sockeye salmon in March; it might have a green head, and it is

- red, but it is still a sockeye salmon. You can go over there on New Year's Day and get a fresh sockeye salmon.
- But, I think, when they are spawning, that is where they hit the spring waters, where it does not freeze. It is always open, even in the dead of the winter. It is always open; you got to be careful there. Especially up in Lake Clark, around Kijik. It is, man, 30 below zero, and still open water.
  - They are sensitive, very sensitive. If you put something bad in the water the fish will sense it. They will probably not go up the river, they will go somewhere else. If they spawn here and they notice something different they will move to another spot. The fish are very sensitive.
  - For quite a few years there when we were building up the king salmon run we did not even fish in June. It was just to build up those runs. It is kind of ironic that the kings we built up are on the Koktuli River where that mine is going to go. It is almost a whole decade that we sacrificed to build up that run. We built it up and now it might go away.
  - You do not see Bristol Bay having troubles because our ecosystem is whole and not damaged. We are very appreciative of what we have. In relationship to the mine the place I work up here is the Bristol Bay Economic Development Corporation and... one of the companies we bought is Ocean Beauty Seafoods which is one of the largest salmon producers in Alaska. We put up 161 million pounds of commercially caught goods in a year. So I talk to the people and if there is a mine that goes in like pebble and we have copper coming out and affecting our fish, are you interested in buying our fish? These are customers we sell 300-400 thousand pound lots to. No, we are not interested....We don't want ourselves and our kids to eat contaminated foods.
  - They [Salmon] would not go there [where water is contaminated]. They are also very sensitive to temperature. They have a really keen sensory acuity, not only them, but all the critters, all the birds. ...They are so sensitive in every aspect of that word.
- Wildlife
    - You cannot even get meat like you used to; you cannot even go out hunting for moose or caribou. Nothing is here anymore; everything is disappearing. I know, you know [name] could verify too. There used to be so much caribou, we would see them all over the road, all over the lake, everything.
    - Since the Pebble Mine started their exploration, I speak for everyone around here that we have not had the big caribou herds that come through here anymore.
    - The drill wells are making all the noise. We were over there, my wife and I were over there last spring, and when we went over there to check out the Pebble, there [we] saw three other helicopters right in the same area, and that is lots of traffic. We have not had caribou meat around here ever since. Have not had caribou meat caught here in probably the last 6 years.
  - Vegetation
    - What they used to say, was the first time, when they first moved down to fish camps, then this wild celery, I do not know if you know what that is, but we eat those. They go up on the mountainside and pick lots of that, and then they peel it, they peel the peelings off and we eat the inside part.

- Subsistence activity areas
  - In Easter they went up to Koliganek the next village up. He said people up there caught white fish and pikes. He said the water is good upriver, it is not like down here. I think it is the water that is coming down from up Mulchatna. He thinks it's from them working on that pebble up there [Pebble Mine].
- Culturally important areas
  - There are 10,000 cache pits [at the Kijik archaeological site on Lake Clark] and they are still counting; over 200 houses, which are huge. So it was pretty big.
- Weather and climate
  - There is open water all over. They got drilling rigs that are sitting on open water. You cannot walk up there with knee boots you got to have hip boots there is so much water this year. The ground is saturated.

### **K3.1.3 Cooperating Agencies**

Cooperating agencies review and comment on draft sections of the EIS during development. During that process, some information was presented that would qualify as TEK. Information received pertaining to the topics listed in Section 3.1 is listed below.

- Cultural Resources
  - The village site at Amakdedori, cabins and trails, have significant personal and cultural value to a number of individuals in the borough. The old cabins, trails, and village have personal meaning to many who reside in the borough.

### **K3.1.4 Tribal Consultation**

Information was also collected during government-to-government consultation meetings between the USACE and Tribes. Comments received that pertain to the topics in Section 3.1, Introduction to Affected Environment, are listed below.

- Wildlife
  - Participants stated that the bears move widely across the region from Amakdedori to the mine site and beyond.
  - The road would cross caribou migration paths. Caribou are coming back to the area, the lichen crop is robust.
  - There have been changes in caribou and moose migration patterns due to disturbances associated with Pebble mine exploratory activities conducted over the last decade.
  - Belugas are changing their diets because their food is not available for them anymore.
- Weather and climate
  - The mine site is in bowl, in right wind conditions, can hear noise from the mine.
- Subsistence Use Areas
  - Razor clams on the east side of Cook Inlet are declining so a lot of people dig razor clams on the west side, at Amakdedori. Aquatic resources like clams, crab, herring and shrimp have declined on the east side of Cook Inlet.