UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 155
Seattle, WA 98101-3188

REGIONAL
ADMINISTRATOR'S
DIVISION

November 23, 2020

Mr. Matthew Reece
Minerals Program Manager
Tongass National Forest
Greens Creek Mine North Extension Project SEIS
8510 Mendenhall Loop Road
Juneau, Alaska 99801

Dear Mr. Reece:

The U.S. Environmental Protection Agency has reviewed the U.S. Department of Agriculture, Forest Service's October 9, 2020, Notice of Intent initiating the scoping process for the Greens Creek Mine North Extension Project Supplemental Environmental Impact Statement (EPA Project No. 01-012-AFS). We have also reviewed the October 13, 2020, Amendments to the General Plan of Operations prepared by the Hecla Greens Creek Mining Company (Hecla). We are providing scoping comments pursuant to the National Environmental Policy Act, the Council on Environmental Quality's Regulations Implementing the Procedural Provisions of NEPA (40 C.F.R. Parts 1500 – 1508), and Section 309 of the Clean Air Act. As a cooperating agency, the EPA is supporting the Forest Service in development of the SEIS. We appreciate the opportunity to provide early comments during the scoping period regarding issues to consider for analysis and public disclosure in the Greens Creek Mine North Extension Project SEIS.

On July 16, 2020, CEQ published the final rule to Update the Regulations Implementing the Procedural Provisions of NEPA.[1] The updated Regulations are applicable to federal actions commencing after the September 14, 2020 effective date. The Forest Service conducted NEPA analysis for the Greens Creek Mine in 1984, 1988, 2003, and 2013. We note that the Forest Service received the request from Hecla to amend the General Plan of Operations (GPO) prior to this effective date and plans to apply the NEPA implementing regulations promulgated in 1978, as amended, to this SEIS, which would supplement the analysis in the 2013 Final SEIS.

The Greens Creek Mine is an underground polymetallic gold, silver, lead and zinc mine located within the Tongass National Forest and the Admiralty Island National Monument, adjacent to Hawk Inlet in Southeast Alaska. Hecla proposes to amend the GPO evaluated in the 2013 Final SEIS with the North Extension Project (NEP). The proposed project would provide an additional four to five million cubic yards of tailings and waste rock storage at the existing Tailings Disposal Facility and allow for the planned mineral production at the mine site to 2031 when the current disposal capacity is expected to be exhausted. Additional project components would include a freshwater collection and water management system, relocation of a portion of the B-Road and the powerline corridor, a new electric substation, and additional peat and overburden storage areas.

EPA's scoping comments are provided to inform the Forest Service of issues that we believe are significant and warrant consideration in the SEIS. Overall, we encourage the development of a SEIS that

[1] See https://www.govinfo.gov/content/pkg/FR-2020-07-16/pdf/2020-15179.pdf

compares a full range of reasonable alternatives and evaluates the reasonably foreseeable direct, indirect, and cumulative impacts of the proposed action.

Our detailed comments and recommendations are enclosed and include the following topics:

- Scope of the NEPA Analysis
- Impacts to Environmental Resources
- Surface and Groundwater Quality and Quantity
- Marine Waters and Sediments
- Fugitive Dust
- Impacts to Communities, Human Health and Historic Properties
- Failure Risks, Structural Stability, and Response Training and Planning
- Analysis Tools and Methodology
- Mitigation, Monitoring, and Adaptive Management

EPA appreciates the opportunity to provide scoping comments for the Greens Creek Mine North Extension Project SEIS. We look forward to working with the Forest Service and other cooperating agencies on this important Alaska resource development project. Should you have any questions regarding our comments, please contact me at (907) 271-3411 or jen.mark@epa.gov.

Sincerely,

Mark Jen

Digitally signed by Mark Jen
Date: 2020.11.23 16:14:14 -09'00'

Mark Jen
NEPA Lead Reviewer

Enclosure: Scoping Comments - Greens Creek Mine North Extension Project Supplemental EIS

U.S. Environmental Protection Agency, Region 10
Scoping Comments for the Greens Creek Mine North Extension Project
Supplemental Environmental Impact Statement

SCOPE OF THE NEPA ANALYSIS

Purpose and Need

EPA recommends that the SEIS include a clear and concise statement of the underlying purpose and need for the proposed project, consistent with the implementing regulations for NEPA[2] and the Clean Water Act Section 404(b)(1) Guidelines for the discharge of dredged and/or fill material to waters of the United States.[3] In presenting the purpose and need for the proposed action, the SEIS should reflect not only the Forest Service's purpose in responding to the proposed action, but also the broader public interest and need for this project. We recommend that the U.S. Army Corps of Engineers' basic and overall project purposes to support the least environmentally damaging practicable alternative (LEDPA) be identified in the SEIS. An appropriately defined purpose and need statement is important in developing the analysis of a range of reasonable and practicable alternatives in the SEIS that will meet the requirements of both NEPA and the CWA Section 404(b)(1) Guidelines.

Proposed Action – North Extension Project

The Amendments to the General Plan of Operations North Extension Project[4] represent the proposed action to be analyzed in the SEIS. At this stage of the NEPA process, there is insufficient information regarding certain project components. In particular, the SEIS should provide specific information regarding the sources and the estimated volumes of wastewater, peat, and overburden material that would be generated from the proposed action. This information is important to evaluate (1) the reasonable and practicable alternatives to the proposed action and (2) the direct, indirect, and cumulative impacts from the proposed action and action alternatives in the SEIS.

Range of Reasonable Alternatives

We recommend that the SEIS identify and evaluate a range of reasonable and practicable alternatives that address the purpose and need for the proposed project, are responsive to the issues identified during the scoping process and through tribal consultation and coordination, and include options for avoiding and minimizing significant environmental impacts. This will ensure that the NEPA analysis provides agency decision makers and the public with information that defines the issues and identifies a clear basis for the choices made among the range of reasonable alternatives, as required by NEPA.

The SEIS should "rigorously explore and objectively evaluate all reasonable alternatives"[5] even if some of them are outside the capability or the jurisdiction of the agency preparing the SEIS for the proposed action.[6] This includes identifying the specific criteria that would be implemented to (l) develop the range of reasonable alternatives, (2) eliminate certain alternatives, and (3) identify the agency preferred alternative, as appropriate, in the Draft SEIS. In addition, we recommend the SEIS provide a clear discussion and the reasons to eliminate certain alternatives from further detailed evaluation. We recommend referring to the Kensington Mine Plan of Operations Amendment 1 Draft SEIS (October 2020) for examples of specific criteria to evaluate the range of reasonable alternatives.

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[2] 40 C.F.R. §1502.13.
[3] Within the context of the Guidelines, practicable alternatives to the proposed discharge of fill or dredged material are identified "in light of overall project purposes," which is also termed "the basic purpose of the proposed activity." 40 C.F.R. § 230.10(a)(2).
[4] Hecla Greens Creek Mining Company (October 13, 2020). Amendments to the General Plan of Operations North Extension Project Tailings Disposal Facility Greens Creek Mine, Admiralty Island, Alaska. See https://www.fs.usda.gov/nfs/11558/www/nepa/112772_FSPLT3_5412196.pdf.
[5] 40 C.F.R. § 1502.14(a).
[6] 40 C.F.R. § 1502.14(c).

While NEPA requires the evaluation of *reasonable* alternatives to the proposed action, the CWA Section 404(b)(1) Guidelines require the analysis of *practicable*[7] alternatives in order to identify the LEDPA, which is the only alternative that can be permitted by the U.S. Army Corps of Engineers.[8] The analysis of alternatives for NEPA can provide the information for evaluation of alternatives under the Guidelines.[9] Since a CWA Section 404 permit will be needed for certain components of the North Extension Project, we recommend that the SEIS evaluate a range of reasonable alternatives, including the practicable alternatives for any CWA Section 404 permit(s) that would need to be evaluated under the Guidelines.

We commend Hecla for maintaining the proposed project within the currently permitted lease boundary of the Tongass National Forest and non-wilderness areas of the Admiralty Island National Monument in order to avoid additional environmental impacts. We recommend that reasonable alternatives to the proposed action be identified within the lease area. In addition, we recommend that the following alternatives be carried forward for detailed analysis in the SEIS in order to compare the direct, indirect, and cumulative environmental impacts to the proposed action:

Tailings Disposal Facility Extension

EPA prefers extension of the existing TDF to adjacent areas rather than evaluating new isolated areas to manage the filtered tailings. We recommend that the SEIS evaluate the TDF extension to other adjacent areas within the lease area, such as the west, east, and south sides of the existing TDF and determine their practicability under the CWA Section 404(b)(1) Guidelines. A western expansion would be north of the water treatment plant and east of the proposed relocated powerline corridor. A southern expansion would be east of Pond 10. The areas west and south of the TDF may avoid and/or minimize impacts to wetlands, including the South Fork of Cannery Creek. We also recommend evaluating an alternative for the north extension that minimizes impacts to wetlands by reducing the project footprint and/or adding the west and south expansion areas.

We note that an unspecified volume of debris from the historic cannery is disposed near the north end of the existing TDF. We recommend identifying the volumes and evaluating the removal and offsite disposal of the cannery debris from the area in order to accommodate additional tailings and to extend the existing TDF. It may be economical and technologically feasible to transport the historic cannery debris to approved disposal facilities in the Juneau area.

B-Road Corridor Relocation

The proposed project includes relocation of a portion of the B-Road corridor adjacent to the east side of the TDF. We recommend evaluating an alternative to locate the B-Road corridor to the west side of the TDF, which could accommodate extension of the TDF along the east side.

Electric Substation

The proposed project would construct and install a new electric substation near the junction of the A-Road and B-Road. We recommend evaluating different locations within the lease area for the proposed electric substation in order to better understand that the proposed action avoids and/or minimizes impacts to wetlands and other resources. We also recommend evaluating the need for additional substation(s) near the 920 area.

[7] An alternative is *practicable* if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. 40 C.F.R. § 230.10(a)(2).
[8] 40 C.F.R. § 230.10(a).
[9] 40 C.F.R. § 230.10(a)(4).

Powerline Corridor Relocation

The proposed project would relocate the powerline corridor along the west side of the TDF. We recommend co-locating the powerline within the B-Road corridor either aboveground on poles or buried below ground within the road prism, which would avoid and minimize additional surface impacts.

Water Management System and Ponds

The proposed project includes new water management pond options and their estimated footprints (acres) and storage volumes (gallons). We recommend that the SEIS discuss construction of the new water treatment ponds, including excavation and/or impoundment and construction of new access roads. The SEIS should identify the volume of fill material, if any, that would be discharged into wetlands for construction of new access roads. We recommend that the SEIS discuss the conveyance of wastewater, stormwater, and other mine contact water to the water treatment plant.

The SEIS could also explain whether the water treatment plant has the capacity to treat the anticipated additional volume of water. We recommend evaluation of an alternative that combines the existing Pond 7 and 10 into one large water management pond, which may be accomplished by raising the height of the berms and/or excavation to increase the overall water storage volume. Combining and expanding Pond 7 and 10 would avoid direct surface impacts to new areas, including wetlands, within the lease area.

Peat and Overburden Storage Areas

The proposed project identified several new locations and options for peat and overburden storage areas, including estimated footprints (acres) and storage capacity (cubic yards). We recommend that the SEIS evaluate existing Sites where peat and overburden can be stored, such as existing inactive waste rock storage areas, including Site 1350 (5 acres), Site C (2 acres), Site D (7 acres), and Site E (9 acres). We note that the ADEC Waste Management Permit for Hecla indicates that removal of waste rock associated with acid rock drainage and metal leaching from the inactive WRS areas for final disposal underground or in the TDF is either underway or forthcoming.[10] The active waste rock storage area (Site 23), and staging areas at the 920 area and the Hawk Inlet Facility should also be evaluated as alternatives in the SEIS. We also recommend that the SEIS include discussion of any associated roads, including fill material volumes and areas of impact, that would be constructed to access new peat and overburden storage areas. The SEIS should also identify whether the individual storage areas would be lined and/or would require the discharge of fill material into waters of the United States, including wetlands. We recommend that the SEIS evaluate additional options for managing the peat and overburden, which could include beneficial uses and disposal:

Beneficial Use Options (peat should be tested for pollutants and potential ARD/ML).

1. *Erosion, Stormwater, and Sediment Control* - We recommend evaluating the use of peat as a biodegradable option to manage erosion, stormwater, and sediments on side slopes and within ditches. Peat may be alternatives to straw or coconut fibers used in wattles, logs, and blankets as erosion and stormwater best management practices.
2. *Biofiltration* – The unique properties of peat make it an effective biofilter in wastewater treatment systems and may accelerate the biodegradation of wastewater residues. We recommend evaluating the use of peat in different aspects of wastewater treatment, including the mill processing, filter press, stormwater, water ponds, etc.

[10] Alaska Department of Environmental Conservation (February 20, 2020). Waste Management Permit (2020DB0001) for Hecla Greens Creek Mining Company.

3. *Soil Amendment* – We recommend evaluating the use of peat as an organic soil amendment with mineral soils to increase moisture holding capacity and improving soil stability for the growing medium required for final reclamation and closure of the TDF, as well as other project components.
4. *Temporary Barriers* – We recommend evaluating the use of peat for bulk bags/super sacks that can be deployed as temporary barriers for water management, diversion of surface water, flood protection, etc.
5. *Absorbent* – We recommend evaluating the use of peat to absorb hydrocarbons, grease, oil, hydraulic fluid, water and other accidental liquid spills at the mine site.
6. *Energy or Fuel Source* – We recommend evaluating the use of peat as an alternative source for heating and cooking.

Disposal Options

1. *Underground Mine* – We recommend evaluating the disposal of peat be placing directly in the underground mined out stopes, and tunnels.
2. *Tailings Paste Backfill* – We recommend evaluating the disposal of peat by mixing it with tailings and cement and placement as paste backfill in the underground mine;
3. *Barge Off-Site* – We recommend evaluating the disposal of peat by shipping offsite in barges to approved waste disposal facilities in Juneau and other nearby areas in Southeast Alaska.

In evaluating the proposed project and reasonable alternatives, the analysis should consider the performance and effectiveness of proposed project components, design features, environmental protection measures, monitoring, and mitigation.[11] We recommend that the SEIS consider the following:

- The disturbance footprint;
- Habitat value, and impacts from siting project components;
- Source control measures and best management practices (effective management and treatment of tailings and waste rock to prevent or minimize potential acid generation and metal leaching) and containment (impermeable liners and covers);
- Measures to reduce contact between mine waste materials and surface water and groundwater (such as surface water diversions, liners, and covers as recommended above);
- Treatment to ensure compliance with water quality standards;
- The physical stability of structures (e.g., TDF, wastewater treatment ponds, ore stockpile and waste rock storage areas, etc.) during operations and closure. We note that previous stability analyses may not have included evaluation of drainage and consolidation in peat layers and/or soft clays, which may be present at the alternative locations. If peat and/or clay layers occur within the proposed TDF extension areas, water treatment ponds, and other facilities at the mine site, then such evaluations should be completed, and the results considered in pseudo-static analyses of slope and cover stability. We recommend that this evaluation be included in the SEIS.
- Fugitive dust emissions; and
- Impacts to historical, traditional and cultural uses and resources.

Regarding mitigation for purposes of NEPA, we recommend that the alternatives analysis include any additional appropriate mitigation measures and best management practices not already included in the proposed action or alternatives.[12] In the GPO, Hecla identified commitments to (1) environmental

[11] The term mitigation included in this "Range of Alternatives" section is referring to the general term as it applies to NEPA. Compensatory mitigation under CWA Section 404 cannot be used to reduce environmental impacts in evaluating the least environmentally damaging practicable alternatives under Section 40 C.F.R. § 230.10(a). *See* 1990 Memorandum of Agreement between Army and EPA concerning the determination of mitigation under CWA Section 404(b)(1) Guidelines.

[12] 40 C.F.R. §1502.14(f).

measures for water management, air quality, cultural resources, vegetation, wetlands and jurisdictional waters, and fish and wildlife, and (2) environmental monitoring of the mitigation measures. We recommend that the SEIS evaluate reasonable alternatives, including mitigation measures and best management practices not proposed by the project proponent to reduce or minimize adverse impacts to environmental resources. We also recommend that the range of alternatives and mitigation be developed in coordination with the cooperating agencies.

No Action Alternative

The NEPA implementing regulations require that the alternatives analysis include the alternative of no action, which provides a benchmark to compare the magnitude of the environmental effects of the action alternatives, including the proposed action. This NEPA requirement ensures that the EIS sharply defines the issues and provides "a clear basis for choice among options by the decision-maker and the public."[13] Therefore, we recommend that the SEIS evaluate the alternative of no action and compare it with the environmental impacts from a range of action alternatives, including the proposed action.

Direct and Indirect Impacts

The scope of the environmental analysis in the SEIS should evaluate both direct and indirect impacts. We recommend that the SEIS include consideration of all reasonably foreseeable indirect effects caused by the action but that may occur later in time or be farther removed in distance.[14] While NEPA does not require agencies to engage in speculation, "[t]he SEIS must identify all of the indirect effects that are known, and make a good faith effort to explain the effects that are not known but are reasonably foreseeable."[15] We recommend that the SEIS evaluate the indirect impacts resulting from the proposed action and reasonable alternatives to the Admiralty Island National Monument, particularly regarding the wilderness designation for its archaeological, cultural, and historic resources, as well as ecological and scientific values.

Indirect project impacts under NEPA can include secondary effects, defined by the Guidelines as "effects on the aquatic ecosystem that are associated with the discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material."[16] The consideration of secondary effects is necessary for analysis regarding compliance with the Guidelines and examples of potential secondary effects are discussed below.

Cumulative Effects

In accordance with NEPA, the cumulative impacts analysis should identify how resources, ecosystems, and communities in the vicinity of the project have already been, or will be affected by, past, present, or reasonably foreseeable future activities in the project area, "regardless of what agency (federal or non-federal) or person undertakes such other actions."[17]

The Guidelines also fundamentally require consideration of reasonably foreseeable cumulative effects in determining whether a project complies with the significant degradation prohibition and to ensure that discharges of dredged or fill material will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern.[18]

[13] 40 C.F.R. §§ 1502.14, 1508.25(b)(1).
[14] 40 C.F.R. § 1508.8(b).
[15] Forty Most Asked Questions Concerning CEQ's NEPA Regulations, Question 18 (CEQ 1981).
[16] 40 C.F.R. § 230.11(h).
[17] 40 C.F.R. §1508.7.
[18] 40 C.F.R. § 230.10(c).

For the cumulative impact assessment, we recommend that the SEIS delineate appropriate geographic boundaries at an appropriate scale, including natural ecological boundaries whenever possible, as well as consider an appropriate temporal timeframe for the project's effects. Data results, monitoring and resource reports developed after the 2013 Final SEIS for the Greens Creek Mine should be used to evaluate the significance of any changes or degradation that has occurred due to construction and mining activities.

Past, present, and reasonably foreseeable future activities that should be considered in the cumulative impact assessment will vary across the geographic scope of the various mine-site and infrastructure components. Please refer to CEQ's "Considering Cumulative Effects Under the National Environmental Policy Act"[19] and the EPA's "Consideration of Cumulative Impacts in EPA Review of NEPA Documents"[20] for assistance with identifying appropriate boundaries and identifying appropriate past, present, and reasonably foreseeable future projects to include in the analysis. In particular, we recommend that the cumulative effects analysis consider, but not be limited to, the following:

- Past and current exploration, mining claims, and active hard rock mining activities conducted by the applicant and other entities at the mine site and nearby areas of the Admiralty Island-Funter Bay Mining District, Mansfield Peninsula, and Admiralty Island National Monument and Wilderness area;
- Current and proposed activities occurring in Hawk Inlet and Young Bay watersheds, including their drainages, and in Southeast Alaska;
- Reasonably foreseeable future activities and use of project infrastructure; and
- Reasonably foreseeable future expansion of the mine beyond the timeframe that is currently proposed and how that coincides with the currently proposed reclamation and closure plan, as well as influence current alternatives.

Summary of the Scoping Issues

EPA commends the Forest Service for hosting several virtual public scoping meetings with local Tribes and communities and making the recording of those meetings available on the project website.[21] We recommend that the Public Participation Plan be made available on the project website, as well. In addition, we recommend that the Draft SEIS include a summary that identifies all alternatives, information, and analyses submitted by Federal, State, Tribal, and local governments and other public commenters during the scoping process for consideration by the lead and cooperating agencies in developing the SEIS. A scoping summary report should be available to the public via the project website and referenced in the SEIS.

IMPACTS TO ENVIRONMENTAL RESOURCES

The Greens Creek Mine is located in Southeast Alaska on the Tongass National Forest and the Admiralty Island National Monument. The primary land use designation (LUD) in the Tongass Land and Resource Management Plan is Semi-Remote Recreation. The southern portion of the project area is located in the Non-Wilderness National Monument LUD. Hawk Inlet is the receiving water for mine wastewater and stormwater discharges under the Alaska Pollutant Discharge Elimination System.

[19] See http://ceq.hss.doe.gov/nepa/ccenepa/ccenepa.htm.
[20] See http://www.epa.gov/compliance/resources/policies/nepa/cumulative.pdf.
[21] https://www.fs.usda.gov/project/?project=57306.

Tongass National Forest

As the nation's largest national forest, the Tongass contains the greatest area of remaining old growth temperate rainforest in North America. The Tongass National Forest provides important habitat for fish and wildlife, including all five species of Pacific salmon, and other species uniquely adapted to the rainforest ecosystem, such as the Alexander Archipelago Wolf, the Queen Charlotte Goshawk, and Marbled Murrelet. In addition, the Tongass is home to over 30 communities, and supports tourism, recreation, and commercial and sportfishing, as well as subsistence and personal use activities by local residents and Native Alaskan tribes for fishing, hunting, harvesting berries, native plants and shellfish, and other cultural activities. The Tongass National Forest also supports carbon sequestration and storage, which helps moderate changes in climate. We recommend that the SEIS fully evaluate the potential direct, indirect, and cumulative impacts to important biological, ecological, and physical resources that comprise the Tongass National Forest near the Greens Creek Mine area.

Admiralty Island National Monument and Wilderness Area

In 1978, under Presidential Proclamation, the Admiralty Island National Monument was designated for its archaeological, cultural, and historic resources, as well as ecological and scientific values. The island is characterized by rugged coastlines, remote pristine old growth temperate rainforest, mountains, and alpine tundra with permanent icefields. It supports the largest density of brown bears and nesting bald eagles in the world, as well as Sitka-black tailed deer, boreal toads, harbor seals, porpoises, sea lions, humpback whales, and Pacific salmon. In 1980, Congress passed the Alaska National Interest Land Conservation Act (ANILCA) that designated over 90 percent of the Admiralty Island National Monument as the Kootznoowoo Wilderness, which is the ancestral home of the Angoon Tribe of the Tlingit Indians. The present and future generations of Tlingit continue to be dependent on the subsistence resources provided by Admiralty Island. Angoon is the permanent tribal community and continues to be an important cultural and spiritual base for the Tlingit people. In 1986, the United Nations (UNESCO), designated two units in Southeast Alaska, Admiralty Island and Glacier Bay, as biosphere reserves because of the glacial geology and ecological succession of plants and animals that follows glacial retreat. The earliest evidence of human occupation in the area dates back 10,000 years. In the 18th and 19th century, settlements developed in connection of European mining, fur trading, logging, and commercial fishing. Cultural resources in the area include the remains of fish canneries, whaling stations, and mining cabins. We recommend that the SEIS evaluate the potential direct, indirect, and cumulative impacts to important archaeological, cultural, and historic resources, as well as ecological and scientific values that comprise the Kootznoowoo Wilderness area of the Admiralty Island National Monument.

Due to the important National Monument values of the Kootznoowoo Wilderness, we encourage the Forest Service to coordinate with the Angoon Community Association in developing a comprehensive management plan for the Kootznoowoo Wilderness. The Plan should establish management measures to ensure compatible uses and values of the Kootznoowoo Wilderness area with mining activities. We recommend that the Forest Service establish a citizen advisory committee representing Tribal members from the Angoon, Hoonah, Douglas, and Juneau areas, as well as other local experts.

Hawk Inlet

Hawk Inlet serves as the traditional subsistence fishing, hunting, and harvesting of seaweed and shellfish for Angoon, Hoonah, and Auk Village (Juneau) Tlingit communities. The marine fjord extends seven miles north from Chatham Strait near the Greens Creek Delta to a tidal mudflat estuary at its headwaters. Hawk Inlet receives mine wastewater and stormwater discharges authorized under the APDES Permit for the Greens Creek Mine. In 1983, dispersion dye testing in Hawk Inlet

determined that over each tidal cycle, an average of 13 billion gallons of water is flushed from the inlet.[22] At that rate, it is estimated that the inlet may completely flush once every five tidal cycles. Ore concentrate was spilled into Hawk Inlet at the ore loading area, which resulted in the Alaska Department of Environmental Conservation listing an area in Hawk Inlet as an impaired water under CWA Section 303(d). In 2017, ADEC established a Total Maximum Daily Load for cadmium, copper, lead, mercury, and zinc in marine sediments of Hawk Inlet. We recommend that the SEIS evaluate potential sources of pollutants that may contribute to the direct, indirect, and cumulative impacts to important subsistence, biological, ecological, and physical resources of Hawk Inlet.

Wetlands and Aquatic Resources

The Clean Water Act Section 404(b)(1) Guidelines are the substantive environmental criteria for the evaluation of proposed discharges of dredged and/or fill material. Applicants must demonstrate compliance with the Guidelines.[23] Because aspects of the NEP would require a CWA Section 404 permit, we recommend that the organization of the SEIS facilitate the Corps' evaluation of the proposed project's compliance with the Guidelines. We recommend that issues relevant to compliance with the Guidelines be addressed explicitly in the SEIS or a stand-alone Section 404(b)(l) analysis be included as an appendix. As mentioned above, we recommend that the range of reasonable alternatives be evaluated in the SEIS to adequately identify the LEDPA in the Final SEIS.

The Guidelines prohibit any proposed discharge of dredged or fill material that does not include all appropriate and practicable measures to avoid and minimize potential harm to the aquatic ecosystem.[24] Subpart H of the Guidelines identifies numerous possible steps to minimize impacts, including, but not limited to:

- Reducing the footprint of the project, using co-location of facilities whenever practicable;
- Implementation of best management practices and mitigation measures to reduce environmental impacts; and
- Configuring the project footprint to reduce or eliminate impacts to higher functioning aquatic resources and other appropriate and practicable measures.

In addition, the Guidelines prohibit the authorization of a proposed discharge of dredged or fill material that would cause or contribute to the violation of an applicable water quality or toxic effluent standard, jeopardize a listed threatened or endangered species, or impact a marine sanctuary.[25] We recommend that these criteria also be included in the evaluation of the reasonable alternatives to the proposed action.

<u>Characterizing Aquatic Resources and Wetlands</u>

We recommend that the SEIS describe the wetlands and aquatic habitats in the affected environment by resource type using the data sources and classification approaches that provide the greatest resolution possible. For example, if wetlands are identified and characterized using the Cowardin classification and/or the Hydrogeomorphic approach, that mapping should include the smallest identifiable map unit. Likewise, we recommend that streams be classified and mapped accordingly. The baseline information for aquatic resources should include their functional condition and integrity. We also recommend that the SEIS evaluate the characteristics of the potentially affected aquatic resources, how those characteristics provide fish habitat, and how such habitat could be adversely impacted by the proposed project. Wetlands and streams perform different functions at different rates, and characterizing this information is critical for evaluating the potential environmental impacts of the proposed action,

[22] Slotta Engineering Associates, Inc. (1983). Environmental Studies Greens Creek Mining Joint Venture: Hawk Inlet.
[23] 40 C.F.R. § 230.12(a)(3)(iv).
[24] 40 C.F.R. § 230.10(d).
[25] 40 C.F.R. § 230.10(b).

alternatives, and reasonably foreseeable actions on these resources.

The Greens Creek Mine is located in the Greens Creek, Zinc Creek, Cannery Creek and Tributary Creek drainages, which all flow into Hawk Inlet. Characterizing the distribution of resident and anadromous fish in potentially affected streams and other aquatic resources is also important, and we recommend that the SEIS include the use of data sources, such as the Anadromous Waters Catalog[26] and the Alaska Freshwater Fish Inventory.[27] We recommend that the SEIS identify all State catalogued anadromous fish streams important for rearing, migration, and spawning. We recommend that the SEIS evaluate the baseline conditions of these drainages, including the direct, indirect, and cumulative impacts resulting from mine activities on important aquatic resources and fish habitat.

Aquatic Resource Impacts Analysis

We recommend that the areal extent (i.e., acreage) of impacts to wetlands and aquatic resources be quantified in the SEIS for both direct and indirect impacts. The acreage values for the direct and indirect impact footprints should include the acreage for streams as well as for wetlands, ponds, lakes, and other waters. For streams, the loss of channel length should also be quantified by linear feet and/or miles since channel length is a more intuitive metric than the acreage values. In addition to the areal or linear extent, impacts to aquatic resources should also be quantified by the expected change in the function these resources perform, including fishery support functions, or change in the condition of the resource.

We recommend that the SEIS include information regarding current and proposed future actions that may impact the flow regimes of Cannery, Tributary, and Greens Creeks. Flow changes would be associated with water withdrawals, the alternation of surface and groundwater flows, including the capture, treatment and discharge, and the loss of wetland area. We also recommend that the SEIS include an analysis and discussion of the potential impacts from the proposed B-Road alignment crossing Cannery Creek, the type of stream crossing (e.g., culvert or bridge) and the potential loss of habitat and stream function.

Direct effects are impacts on aquatic resources within the footprint of the discharge of dredged or fill material. Direct effects at the mine site would include wetland, stream, and other aquatic resource losses within the footprints of the TDF, the ore storage and WRS areas, and other mine site facilities described for the NEP.

Indirect effects on aquatic resources are those associated with the discharge of dredged or fill material, but do not result from actual placement of this material. These effects are also considered secondary effects under the Guidelines. Examples of indirect effects that should be evaluated in the SEIS include, but not be limited to:

- Elimination of streams and wetlands due to expansion of the TDF, freshwater ponds, peat and overburden storage areas and other components;
- Fragmentation of aquatic resources due to construction and expansion of project components;
- Degradation of downstream fish habitat due to streamflow alterations resulting from water capture, withdrawal, storage, treatment, or release at the mine site;
- Degradation of downstream fish habitat due to water quality impacts associated with mine construction and operation;
- Degradation of downstream fish habitat due to the loss of important inputs such as nutrients and groundwater from upstream sources; and
- Degradation of aquatic resources due to fugitive dust deposition from the TDF, other mine facilities, and transportation activities.

[26] See https://www.adfg.alaska.gov/sf/SARR/AWC/.
[27] See http://www.adfg.alaska.gov/index.cfm?adfg=ffinventory.main.

Deposition of fugitive dust from the TDF, gravel roads and pads, and other sources at the mine site may smother aquatic vegetation and wetland areas resulting in impairment of their functions and values. For example, the Alaska Stand Alone Pipeline Project Final Supplemental EIS identified that fugitive dust could travel up to 50 feet from gravel roads and, depending on the prevailing wind direction, up to 350 feet from material sites.[28] We have concerns that fugitive dust may be deposited to the ground surface and indirectly degrade or impair important wetland and aquatic resource functions and values, such for water quality and fish and wildlife habitat. We recommend that the SEIS include estimates of the magnitude (e.g, distance and area from the source of the fugitive dust) of the indirect impact and an evaluation of the potential for functional degradation and/or impairment to wetlands and aquatic resources.

Functional Assessments

We recommend that the SEIS include discussion of the functions performed by the wetlands and aquatic resources that would be impacted by the proposed project. Information regarding the functions performed by wetlands impacted by the proposed project is important to quantify the extent of project-related changes and identify the likely environmental consequences of those changes in the SEIS. In addition, functional assessment is relevant to support the CWA Section 404(b)(1) analysis and compensatory mitigation. The joint EPA/Corps Final Rule regarding *Compensatory Mitigation for Losses of Aquatic Resources*[29] states that functional or condition assessment methods should be used where practicable to determine how much compensatory mitigation is required to offset project impacts. Wetland function assessment method developed by the ADEC is available for the Coastal Southeast and Southcentral Ecoregion.[30] In addition, the Wetland Ecosystem Services Protocol for Southeast Alaska (WESPAK-SE)[31] has been used to assess wetland functions within the City and Borough of Juneau.

Water Quality and Quantity

Evaluating Impacts to Surface and Groundwater

We recommend that the SEIS: (1) characterize baseline surface water and groundwater quality, quantity, and interactions; (2) evaluate whether direct, indirect, and cumulative impacts from the Greens Creek Mine operations have resulted in impacts that are different than those predicted in the 2013 Final SEIS; and (3) upon the updated baseline conditions, evaluate the water quality and quantity impacts of all aspects of the proposed mine operations and alternatives. We recommend this include potential surface water impacts from mine facilities due to the potential for acid rock generation and metal-leaching resulting from mining activities and waste management, as well as the potential for the construction of roads and powerlines, freshwater ponds and peat and overburden storage areas, expansion of the TDF, relocation of the power station, and operational activities that could contribute to sediment loading into adjacent streams. We also recommend evaluating potential impacts to surface and groundwater resulting from fugitive dust sources, such as the TDF, gravel roads and pads, as well as other mine components and operations.

EPA recommends that the SEIS specifically include the following information in the water resource analysis for the proposed project and alternatives (see our recommendations below for Analysis Tools and Methodologies):

[28] U.S. Army Corps of Engineers. (2018). Alaska Stand Alone Pipeline Project, Final Supplemental Environmental Impact Statement. See http://www.asapeis.com/docs.htrnl.

[29] 40 C.F.R. § 230.93(a)(1).

[30] Alaska Department of Environmental Conservation. (2003). *Wetland Functional Assessment Operational Draft Guidebook for Assessing the Functions of Riverine and Slope River Proximal Wetlands in Southeast and Southcentral Alaska, Using the HGM Approach.*

[31] Adamus, P.R. (2015). *Manual for Wetland Ecosystem Services Protocol for Southeast Alaska (WESTPAK-SE)*.

- Characterization of existing groundwater, surface water, springs, and wetland resources, including acreages and channel lengths; groundwater levels, flow direction and gradients; chemistry; habitat types, values and functions of wetlands and surface waters;
- A detailed water balance model identifying the water sources and volumes and discharge locations;
- Development of a hydrogeologic conceptual site model, including, but not limited to, maps of groundwater, surface water, springs, and wetland resources in the area to be developed or affected;
- Information on the quantity and location of aquifers, including underground sources of drinking water, recharge zones and source water protection areas;
- Identification of any CWA Section 303(d) listed impaired waterbodies, development of waterbody recovery plans, establishment of TMDLs, and any existing restoration efforts for those waters;
- Identification and description of surface and groundwater hydrologic pathways (e.g., the connectivity of springs or groundwater to surface waters; the connectivity of all streams to each other and to wetlands);
- Assessment of which waters may be impacted, the sources and nature of potential impacts (both quality and quantity), and a comparison to applicable environmental standards (e.g., surface water and drinking water quality standards);
- Consideration of downstream impacts and potential for changes in metal speciation and bioavailability;
- Evaluation of surface water and groundwater use, including maps and source identification of agricultural, domestic, and public water supply wells or intakes; and
- Consideration of effects of seasonality on water quantity and quality impact assessment, including predictions for all phases of the project (construction, operations, and closure).
- Identification and summary of prior data, models, studies, reports, and monitoring results that have been conducted for the Greens Creek Mine.

Water Management and Treatment

We recommend that the SEIS describe the plans for water management, treatment, and discharge associated with NEP during operations and closure. Specifically, we recommend that the SEIS:

- Evaluate the adequacy, reliability, effectiveness, and uncertainty associated with ongoing and closure water management and treatment, accounting for seasonality and potential changes associated with future climate scenarios and trends;
- Characterize current and predicted chemical compositions, mass loadings, and quantities of process waters, mine drainage, storm water, and treated and untreated effluent and disclose any chemistry and mass loading differences and any changes to the water management and treatment processes that were identified in the 2013 Final SEIS;
- Include modeling of predicted stream concentrations of contaminants of concern to evaluate the potential impacts to water quality; and
- Identify the APDES discharge locations, receiving waterbodies, and applicable water quality standards, and ability of discharges to meet applicable standards. We recommend that the SEIS describe the wastewater and storm water discharges and identify and discuss any mixing zones that would be required. We also recommend that any planned or potential requests for water quality standard revisions be disclosed in the SEIS.

State Permits, Authorizations, and Approvals

We recommend that the SEIS discuss the State of Alaska issued permits, authorizations, and approvals and their requirements for the Greens Creek Mine and any changes and/or modifications to those

permits, authorizations, and approvals as a result of the proposed project. This would include those issued by ADEC (e.g., wastewater discharges, waste management, certificate of reasonable assurance, etc.), ADNR (e.g., reclamation and closure, water withdrawal and diversion, dam safety, etc.), and ADFG (e.g., fish habitat).

In particular, ADEC issued the APDES Permit (AK-0043206) for the Greens Creek Mine, which became effective on October 1, 2015.[32] Hecla is authorized to discharge at specific locations into Hawk Inlet, Zinc Creek, Greens Creek, and wetlands. We recommend that the SEIS discuss the State's water quality standards for these receiving waters, such as their use classification, numeric and/or narrative water quality criteria, and antidegradation policy. In addition, we recommend that the SEIS discuss the wastewater discharge compliance history at the mine site.

EPA notes that Hecla has applied for APDES permit reissuance. We recommend that the SEIS discuss the proposed changes to the APDES permit, such as to the allowable discharges, effluent limitations, monitoring requirements (e.g., Hawk Inlet and Whole Effluent Toxicity), mixing zones, as well as requirements for monitoring, recording, and reporting, submitting plans, and complying with permit conditions and best management practices. We recommend that the SEIS evaluate the direct, indirect, and cumulative impacts to Hawk Inlet, Zinc Creek, Greens Creek, and wetlands resulting from the mine wastewater and stormwater discharges based on monitoring results, data, reports, and studies since the issuance of the 2013 Final SEIS.

Antidegradation

The antidegradation provisions of the CWA apply to those waterbodies where water quality standards are currently being met. In certain state-designated high-quality waters, the anti-degradation provisions of the CWA require that the level of water quality necessary to protect existing uses of a waterbody be maintained and protected.[33] We recommend that the SEIS discuss the CWA anti-degradation requirements and the approach to fulfilling these requirements.

Sediment Management and Stormwater Runoff

We recommend the SEIS evaluate construction design and operation practices that will be used to minimize erosion and control storm water runoff and sediment loading to surface waters. We recommend that the SEIS discuss specific mitigation measures that may be necessary to prevent and minimize adverse impacts to water quality and disclose their effectiveness. We suggest that the Forest Service consider the industrial stormwater best management practices identified by the EPA for mineral mining and processing facilities[34] and specify those that would be suitable for the project. We also recommend that the SEIS document the project's consistency with applicable APDES stormwater permitting requirements.

Geochemical Characterization - Acid Rock Drainage and Metal Leaching

To provide reliable predictions of water quality and impacts to surface water and groundwater due to wastewater and mine waste discharges, we recommend that the physical and chemical characteristics of the ore body, construction rock, waste rock, tailings, and other potentially acid generating bulk materials be evaluated in the SEIS. We recommend that the SEIS document the representativeness of samples used to support projections, which represent a range of conditions that currently occur and could occur in the future, including climate trends. We recommend that physical and chemical characterization be conducted in a manner that provides environmentally conservative estimates of impacts.

The EPA Region 10's *Hardrock Mining Source Book for Industry* may be a useful resource for

[32] See http://dnr.alaska.gov/mlw/mining/largemine/greenscreek/.
[33] 40 C.F.R. § 131.12.
[34] See https://www3.epa.gov/npdes/pubs/sector_j_metalmining.pdf.

recommendations related to the NEPA analyses of mining projects.[35] We recommend that the following information be utilized to characterize geologic and mineralogy setting/aqueous geochemistry in the baseline environment and impact prediction sections of the SEIS: whole rock analysis, mineralogy, drill core descriptions, block or similar models, acid-base accounting, long-term kinetic testing, and hydrogeochemical models for prediction of water quality with sufficient inputs. We note that the filtered dry stack tailings in the TDF has the potential to generate acid rock drainage, resulting in metals leaching to the surrounding surface and groundwater. We recommend that the SEIS evaluate seepage quality and quantity from the TDF and potential changes to water treatment, storage, and management due to the extension of the TDF. We recommend that the SEIS include plans for geochemical monitoring of these bulk materials for potential acid generation and metals leaching.

Marine Waters and Sediments

Evaluating Impacts to Hawk Inlet

We recommend that the SEIS: (1) characterize baseline marine water quality, quantity, sediments, and their interactions; (2) evaluate whether impacts of the Greens Creek Mine operations have resulted in impacts to Hawk Inlet that are different than those evaluated in the 2013 Final SEIS; and (3) upon the updated baseline conditions, evaluate the marine water quality, quantity, and sediment impacts of all aspects of the proposed mine operations and alternatives.

CWA Section 303(d) Listed Waterbody and Total Maximum Daily Load

In 1989, ore concentrate was accidentally spilled into Hawk Inlet at the ore concentrate loading area. In 1994, suction dredging was used to remove an unknown quantity of ore concentrate. However, remnant debris from the former cannery at the Port Facility that had burned down in 1974 complicated cleanup efforts. In 2012, ADEC listed 1.12 acres of the tidal and submerged lands of Hawk Inlet around the Greens Creek Mine ore concentrate loading dock on the CWA Section 303(d) Impaired Waters List as a Category 5 water body for nonattainment of the toxic and deleterious organic and inorganic substances water quality standards. In 2017, ADEC established a Total Maximum Daily Load (TMDL) for cadmium, copper, lead, mercury, and zinc in marine sediments of Hawk Inlet.

We recommend that the SEIS discuss the status of the CWA Section 303(d) List waters and the TMDL established for Hawk Inlet and evaluate the direct, indirect, and cumulative impacts resulting from the proposed project on marine water quality and sediments. We recommend that the SEIS discuss the past and present monitoring requirements for Hawk Inlet, which includes annual monitoring of the water column, sediments, and in-situ bioassays of marine invertebrates (e.g., polychaete worms and mussels).[36] We recommend that the SEIS include additional conservation and mitigation measures and best management practices to avoid and minimize impacts to Hawk Inlet from the proposed project.

ADEC identified potential sources of metal contamination to Hawk Inlet, which may vary by area in the inlet, including the ore concentrate spill and the historic fish cannery. Other potential sources include nonpoint source runoff from abandoned mines in the area, fugitive dust from the TDF, shipping and docking operations, natural sources, and internal loading.[37] We recommend that the SEIS identify and evaluate the potential sources of pollutants to Hawk Inlet which may contribute to direct, indirect, and cumulative impacts to its important subsistence, biological, ecological, and physical resources. We recommend that the SEIS identify and evaluate potential pathways for contamination

[35] U.S. Environmental Protection Agency Region 10 (2003). EPA and Hardrock Mining: A Source Book for Industry in the Northwest and Alaska. See https://www.epa.gov/sites/production/files/2018-11/documents/epa_and_hardrock_miningsec508.pdf.
[36] Hecla Greens Creek Mining Company (March 1, 2020). Hawk Inlet Monitoring Program 2019 Annual Report.
[37] Alaska Department of Environmental Conservation (May 2017). Total Maximum Daily Load for Metals in the Marine Sediments of Hawk Inlet near Juneau, Alaska.

from all potential sources and pathways for exposure to marine benthic organisms and higher trophic level organisms.

In addition, we have concerns regarding shipping and docking operations at the Hawk Inlet Facility. The propeller wash from ore concentrate freighters, tugboats, and other marine vessels at the docking facility, at lower tides, may temporarily suspend sediments/contaminants in the water column and redistribute and disperse them outside the designated CWA Section 303(d) listed area. We recommend that the SEIS evaluate current shipping and docking operations and implement best management practices and operating guidelines to minimize the suspension, redistribution, and dispersion of potentially contaminated sediments in Hawk Inlet.

Ballast Water Discharges – Invasive Species

On December 4, 2018, the Vessel Incidental Discharge Act was signed into law, which requires EPA to develop new national standards of performance for commercial vessel incidental discharges and the U.S. Coast Guard to develop corresponding implementing regulations. In 2013, pursuant to the CWA Section 402, EPA issued the Vessel General Permit, which requires authorization to discharge ballast water and other pollutants incidental to the normal operation of certain commercial vessels into navigable waters. The VIDA legislation has extended the effective date of the 2013 VGP until EPA finalizes new regulations.

On October 26, 2020, EPA published a Notice of Proposed Rulemaking for Vessel Incidental Discharge National Standards of Performance under the 2018 VIDA that would establish national standards of performance for marine pollution control devices for discharges into the waters of the United States or the waters of the contiguous zone. The proposed national standards of performance were developed in coordination with the U.S. Coast Guard. The proposed standards, once finalized, would be implemented through corresponding USCG regulations addressing implementation, compliance, and enforcement.

Ballast water discharges may adversely impact marine water quality resulting from changes in temperature, salinity, dissolved oxygen, pH, and other pollutants. In addition, we have concerns regarding the introduction of non-native marine invasive species/organisms that may be comingled with the discharge ballast water into Hawk Inlet from ore concentrate freighters. We recommend that the SEIS discuss ballast water management practices and mitigation measures to avoid and minimize the potential adverse impacts to marine water quality and to avoid introduction of marine invasive species/organisms. In addition, we recommend that the operation of USCG-type approved ballast water treatment systems for ore concentrate freighters be evaluated and disclosed in the SEIS. For ballast water treatment systems that may require the use of biocides, we recommend biocides registered with EPA under the Federal Insecticide, Fungicide, and Rodenticide Act. We encourage the project proponent to develop a Ballast Water Management Plan for ore concentrate freighters to address management and treatment of ballast water.

We recommend that the SEIS describe the different types and classes of marine vessels, their number and frequency for shipping and docking at the Hawk Inlet Port Facility. The SEIS should summarize the ore concentrate freighters, tugboats, supply and freight barges and other marine vessels that call on the port facility each month and/or year. In particular, we recommend that the SEIS evaluate the volume of ballast water that would be discharged from ore concentrate vessels into Hawk Inlet, and identify the water body source(s) where ballast water (seawater) would be taken in, which may include waters of the United States and/or international waters.

As a best management practice, EPA recommends that ballast water exchange for ore concentrate freighters be conducted in waters outside the exclusive economic zone and not less than 200 nautical miles from shore prior to discharging into waters of the United States. We recommend evaluating additional options to the discharge of ballast water into Hawk Inlet, such as a shore-based treatment

system at the Hawk Inlet Facility to avoid and minimize impacts from ballast water exchange in Hawk Inlet.

Air Quality

The EPA recommends that the SEIS evaluate the impacts from construction and operation of the project and alternatives on air quality. We recommend identifying the measures and/or best management practices that may be needed to mitigate potential significant impacts. Such an evaluation is necessary to ensure compliance with state and federal air quality regulations, and to disclose the potential impacts from temporary and/or cumulative degradation of air quality.

Sources of Emissions

Potential air pollutant sources of concern for the proposed project may include:

- Operation of heavy machinery and equipment during construction that results in the emission of fossil fuel combustion exhausts;
- Fugitive dust emissions from the TDF, gravel roads and pad, construction and operations associated with material movement, storage and transportation at different facilities at the mine site;
- Criteria and hazardous air pollutant emissions related to increased mill and facility processing and output, including emissions from electricity generation;
- Hazardous Air Pollutants may result from fuel combustion and ore processing. The *National Air Toxics Assessment* asserts that a large number of human epidemiology studies show increased lung cancer associated with diesel exhaust and significant potential for non-cancer health effects.[38] Also, the Control of Emissions of Hazardous Air Pollutants from Mobile Sources Final Rule[39] lists twenty-one compounds emitted from motor vehicles that are known or suspected to cause cancer or other serious health effects. We recommend that the SEIS disclose whether hazardous air pollutant emissions would result from the project construction and operations, discuss the health effects associated with air toxics and diesel particulate matter and identify sensitive receptor populations and individuals likely to be exposed to these emissions.

Air Quality Analysis

We recommend that the SEIS implement these steps for the air quality analysis:

1. Characterize the baseline conditions to set the context for evaluating project impacts and disclose whether there are differences from the characterization in the 2013 Final SEIS, including:
   - Regional climate and meteorology;
   - Air quality and any relevant air quality related values (e.g., visibility, dust deposition);
   - Past and present air quality sources and impacts;
   - Identification of sensitive receptors in the vicinity (such as communities and any sensitive wilderness areas identified by state or federal land managers);
2. Identify applicable local, state, and federal air quality regulations, current air permits, and any air permitting requirements that apply to new and modified air pollutant sources associated with the proposed project;
3. Develop a comprehensive inventory of current and project-related increases of criteria pollutant emissions (in tons per year), greenhouse gas emissions (in metric tons CO_2-equivalents per year) and hazardous air pollutant emissions; and
4. If the projected emission increases are significant, then near-field air quality modeling should be conducted to assess project-related air quality and/or dust deposition impacts.

[38] See https://www.epa.gov/technical-air-pollution-resources.
[39] 66 Fed. Reg. 17230, March 29, 2001.

Fugitive Dust

We recommend that the SEIS evaluate impacts from fugitive dust, including the identification of potential sources and sinks, distribution and dispersion from sources, and pathways of exposure. We recommend that the SEIS include a comprehensive fugitive dust control management plan that outlines the standard operating procedures for monitoring (e.g., water quality and lichens) and controlling dust emissions, and associated record-keeping and reporting. The Plan should include BMPs and other contingencies to address the suppression of fugitive dust emissions, particularly during the cold winter season and high wind events. Sources of fugitive dust at the mine site may include the TDF, unpaved gravel roads, ore and waste rock storage areas, other bulk material stockpiles, and new construction disturbance areas, as well as other areas of the existing and/or expanded facilities where fugitive dust emissions may be generated.

Marine Vessels

During annual operations, ore concentrate freighters, tugboats, supply and freight barges, and other marine vessels travel through Hawk Inlet and make a number of port calls to the Hawk Inlet Facility. We recommend that the SEIS include emissions estimates for the anticipated maximum number of ore concentration freighters and support vessels per year. We also recommend that the SEIS compare the emission estimates to the CAA National Ambient Air Quality Standards and evaluate potential impacts to visibility and regional haze.

Fish and Wildlife Resources

Endangered Species Act, Marine Mammal Protection Act, and Essential Fish Habitat Requirements

The EPA recommends that the SEIS evaluate impacts to fish and wildlife from the proposed project and alternatives. Special consideration should be given to listed and proposed species under the Endangered Species Act, the Marine Mammal Protection Act, and to Essential Fish Habitat identified under the Magnuson Stevens Fishery Conservation and Management Act. NEPA regulations require that, to the fullest extent possible, the SEIS be prepared concurrently with environmental analyses required by the ESA and other environmental laws.[40] The Magnuson Stevens Act, ESA, and MMPA implementing regulations also encourage coordination with other environmental reviews.[41]

We recommend that the SEIS identify the species listed and proposed as "threatened" or "endangered" and their critical habitat designation under ESA, as "depleted" under MMPA and also identify EFH within and around the project area (including Hawk Inlet and Young Bay and their drainages). We recommend that the SEIS describe impacts to these species and to EFH and discuss the mitigation measures proposed to avoid, minimize, mitigate and monitor such impacts. We understand that the Forest Service would develop a biological assessment to evaluate impacts to listed and proposed species and EFH and recommend that it be included as an appendix to the SEIS.

In particular, the Mexico distinct population segment (DPS) of humpback whale is listed as threatened under ESA. Potential threats to humpback whales include inadvertent vessel strikes which can result in injury and/or death. Risks are much higher in coastal areas with heavy ship traffic. Marine vessels movement and noise may harass whales by causing stress and behavioral changes. We recommend that the SEIS evaluate the direct, indirect, and cumulative impacts to humpback whales in the project area resulting from marine vessel traffic in Hawk Inlet and Southeast Alaska. In addition, we recommend that a management plan be developed to ensure that marine vessels avoid and minimize impacts to humpback whales, such as requiring onboard observers, maintaining vessel distances and reducing speeds when whales are observed, and reporting occurrences of whale observations and/or strikes.

[40] 40 C.F.R. § 1502.25.
[41] *See* 50 C.F.R. § 600.92(c), (f), and 50 C.F.R. §402.06, respectively.

We note that the National Oceanic and Atmospheric Administration, National Marine Fisheries Service is in the process of designating Critical Habitat for the humpback whale (Mexico DPS) in Southeast Alaska. We recommend that the SEIS evaluate conservation measures to avoid and minimize direct and indirect impacts to humpback whales and their designated critical habitat areas in Hawk Inlet and Southeast Alaska.

IMPACTS TO COMMUNITIES, HUMAN HEALTH, AND HISTORIC PROPERTIES

Sociocultural Impacts and Accessibility to Cultural and Traditional Use Areas

As the largest private employer in Southeast Alaska, the Greens Creek Mine is anticipated to maintain employment opportunities for Alaska Natives and local residents, and continue to generate revenues for the local economy. While employment opportunities and local revenues generally increase a community's standard of living, they can also impact families, communities and cultures, especially in areas where residents are participating in traditional subsistence and cultural practices. We recommend that the SEIS identify the specific communities, federally recognized Alaskan Tribal Governments and the Alaska Native Claims Settlement Act Corporations that could be impacted by the proposed project, both positively and negatively.

We recommend that the sociocultural impacts associated with all project alternatives be evaluated and disclosed in the SEIS, which could include, but not be limited to:

- Evaluating changes to the local and regional economy that have occurred as a result of operation of the Greens Creek Mine since the 2013 Final SEIS and whether any additional changes could occur as a result of the proposed action;
- Evaluating impacts associated with economic changes to families, communities, and cultures, including potential changes to aspects of the local and regional economy that are currently subsistence-based and evaluating replacement costs of traditional foods if access is impacted; and
- Evaluating the potential decline in the local and regional economy following temporary and/or permanent mine closure due to low metals prices, as well as the impacts to the family and community social structure.

We recommend that the accessibility and compatibility of traditional use areas associated with all project alternatives be evaluated and disclosed in the SEIS, which could include, but not be limited to:

- Identifying and integrating traditional ecological knowledge into the SEIS analysis, as appropriate. Traditional Ecological Knowledge (TEK) can include the collection of local and traditional knowledge concerning the affected environment, and anticipated impacts from the proposed project to communities and Tribal traditional use areas, such as for subsistence users and resources, hunting and trapping, fishing, harvesting of shellfish, seaweed, berries, migration, and other uses. In particular, we recommend including updated information for the Hawk Inlet area, including cultural practices and activities;
- Incorporating information from the Alaska Department of Fish and Game Community Subsistence Information System (CSIS),[42] which is a repository of Alaska community harvest data for local communities, such as Angoon, Hoonah, Douglas, and Juneau;
- Conducting additional TEK studies to clearly identify concerns and potential impacts, including cumulative impacts, from the proposed project and alternatives.
- Identifying changes that have occurred to traditional use areas as a result of mine operation since the 2013 Final SEIS and whether additional project activities may conflict with traditional and accustomed uses including potential access limitations to traditional use areas; and

[42] See http://www.adfg.alaska.gov/sb/CSIS/.

- Coordinating with communities and Tribes to identify mitigation options for avoiding and minimizing conflicts or impacts to traditional and accustomed subsistence uses. Mitigation for sociocultural impacts may include, but not limited to implementing hiring policies for qualified local Alaska Natives.

Community Advisory Committee

We recommend that a Greens Creek Mine Community Advisory Committee be established to address tribal and local community concerns and potential conflicts between subsistence users and resources regarding activities at the mine and Admiralty Island National Monument. For example, the Donlin Gold Advisory Technical Review and Oversight Committee (DATROC) was established as mitigation to minimize the adverse impacts to subsistence resources and users resulting from activities associated with the mine.[43] A community advisory committee for the Greens Creek Mine could also be established as mitigation for potential impacts to subsistence resources and users.

Consultation and Coordination with Alaskan Tribal Governments and Corporations

Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments* (November 6, 2000), was issued to establish regular and meaningful consultation and collaboration with Tribes in the development of federal policies that have tribal implications, and to strengthen the United States' government-to-government relationships with Indian tribes. In addition, pursuant to Public Law I 08-119, 118 Stat. 452, as amended by Public Law 108-4217, 188 Stat. 3267, federal agencies are required to consult with ANCSA Corporations on the same basis as Indian Tribes.

EPA commends the Forest Service for formally inviting Tribes to consult and coordinate on this project. We recommend that the Forest Service develop and implement a *Tribal Government-to-Government Consultation and Coordination Plan* that provides a framework for meaningful engagement with tribal governments and corporations as necessary for this project. We recommend that the Plan describe the process and outcome of any government-to-government and/or government-to-corporation consultations regarding the NEP and the SEIS, issues raised during the consultations and how those issues were addressed. In addition, we recommend that direct outreach be provided to Tribes by sharing the proposed Greens Creek Mine SEIS and other project related documents in whatever manner would best reach each tribal community.

Tribal Cooperating Agencies

We recommend that Native Alaskan Tribal governments be invited to participate as cooperating agencies on the SEIS. Cooperating agency involvement establishes a mechanism for addressing intergovernmental issues throughout the SEIS development process. We recommend that the Forest Service invite potentially affected tribal governments that have the resources and interest in serving as cooperating agencies for the SEIS development, consistent with CEQ Memorandum.[44] Alaska Tribal Governments that currently and/or traditionally utilize land and resources that could be impacted by the project may offer special expertise through traditional knowledge, and cultural and subsistence activities may support baseline information and prediction of impacts to environmental, cultural and other resources.

We note that there is precedent for tribal government participation as cooperating agencies for mining project EISs in Alaska, such as the Red Dog Aqqaluk Expansion, Chuitna, Donlin Gold, and Pebble.

[43] Joint Record of Decision and Permit Evaluation for the Donlin Gold Project, Crooked Creek, Alaska. U.S. Army Corps of Engineers and Bureau of Land Management (August 13, 2018). See http://dnr.alaska.gov/mlw/mining/largemine/donlin/pdf/dg-usace-blm-rod-2018-08-13.pdf.

[44] Council on Environmental Quality Memorandum for Heads of Federal Agencies: Designation of Non-Federal Agencies to be Cooperating Agencies in Implementing the Procedural Requirements of the National Environmental Policy Act (July 28, 1999).

Environmental Justice and Potentially Impacted Communities

In compliance with NEPA and Executive Order 12898 on Environmental Justice, actions should be taken to identify and address disproportionately high and adverse human health or environmental effects of each federal agency's programs, policies, and activities on minority and low-income populations and Native American tribes.[45] Agencies must conduct adequate public outreach and allow for participation that ensures that low income and minority populations, including tribes, understand the potential impacts to their communities and resources.

The CEQ has developed guidance on how to address Environmental Justice in the environmental review process under NEPA.[46] In accordance with this guidance, the EPA recommends that the SEIS address the following points:

- Identify low income, minority and Alaska Native communities that may be impacted by the project;
- Describe the efforts that have been or will be taken to meaningfully involve and inform affected communities about project decisions and impacts and disclose results of those efforts. We recommend making the Public Participation Plan for the Greens Creek Mine available on the project website;
- Evaluate identified project impacts for potential to disproportionately impact low income, minority or Alaska Native communities relative to a reference community;
- Disclose how potential disproportionate impacts and environmental justice issues have been or will be addressed by the Forest Service's decision making process;
- Propose mitigation for unavoidable impacts that will or are likely to occur; and
- Include a summary conclusion, sometimes referred to as an "environmental justice determination" that concisely expresses how environmental justice impacts have been appropriately avoided, minimized, or mitigated.

We also recommend that attention be given to consideration of the dependence of local communities on local and regional subsistence resources, access to those resources, and perception of the quality of those resources. Additional information and tools for environmental justice analysis can be found on the EPA's website.[47]

Health Risk or Impact Analysis

Health impact analysis (HIA) has been used more frequently to assess potential health effects of resource extraction projects since the 2013 Final SEIS was completed. HIA methodology became available for Alaska in 2015 (*Technical Guidance for Health Impact Assessment*[48]). We recommend that the Forest Service evaluate whether an HIA or other level of health impact screening would be warranted for this SEIS. This decision may depend upon whether potential health impacts may have occurred since the 2013 Final SEIS and comments received during scoping related to health concerns.

In 2016, the State of Alaska, Department of Health and Social Services received data on metal contaminants in shellfish (e.g., crab, shrimp, clam, cockle, and mussel), seaweed, and liver, kidney, muscle, and fat from a harbor seal harvested from Hawk Inlet. DHSS assessed the potential for exposure and health effects associated with consuming these foods for the Angoon Community Association. DHSS considered traditional foods community harvest data for Angoon from ADFG to estimate how much of these foods are consumed. Potential health effects of seal tissue consumption for children,

[45] E.O. 12898 (February 11, 1994); Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations.
[46] Council on Environmental Quality (December 10, 1997). Environmental Justice; Guidance under the National Environmental Policy Act. See http://ceq.hss.doe.gov/nepa/regs/ej/justice.pdf.
[47] See https://www.epa.gov/environmentaljustice.
[48] See http://dhss.alaska.gov/dph/Epi/hia/Documents/AlaskaHIAToolkit.pdf.

women who are pregnant or plan to be pregnant, and the rest of the population were evaluated and recommendations provided.[49]

National Historic Preservation Act

Section 106 of the National Historic Preservation Act of 1966 requires federal agencies to consider the effects of their actions on historic properties, including those of traditional religious and cultural importance.[50] The NHPA requires a federal agency, upon determining that activities under its control could affect historic properties, to consult with the appropriate state or tribal Historic Preservation Officer. We recommend that the SEIS discuss potential impacts to historic properties, including any tribal, cultural, or other treaty resources that are historic or traditional cultural properties and identify alternatives and mitigation measures that would minimize these impacts.

FAILURE RISKS, STRUCTURAL STABILITY, AND RESPONSE TRAINING AND PLANNING

Unanticipated Incidents

Unanticipated spills, accidents, and failures represent potential risks to health and safety, and the environment at mining facilities. In 1989, ore concentrate was accidentally spilled into Hawk Inlet, resulting in the area adjacent to the ore loading facility to be listed as an impaired water under CWA Section 303(d) and subsequently requiring a TMDL to be established for the marine sediments. We recommend that the SEIS analyze potential spill risks and impacts on water quality and aquatic resources based, in part, on history of spill incidents at the mine. We recommend that the SEIS disclose the past spills, including, but not limited to, the location, sources and types of spill, the volumes, the areas and receiving waters affected that have occurred since the 2013 Final SEIS. We recommend that the SEIS discuss how each spill incident was addressed.

We recommend that the SEIS describe the control measures and contingency plans that will be in place to prevent and respond to these incidents from occurring during implementation, including evaluation of the proposed design and management of the TDF and other structures and evaluation of wastewater management and reclamation plans to determine the project-specific likelihood of different types of accidents and failures. For those incidents that are determined to be of low probability but high consequence, we recommend that the SEIS evaluate the potential effects of such events on water quality, aquatic ecosystems, fisheries, and other resources. We recommend that the SEIS also discuss mitigation measures and BMPs that could minimize the risk or damages from such incidents.

In particular, we have concerns regarding the potential risk and environmental impacts resulting from a failure of the TDF and water treatment systems and ponds, which could result in the release of potentially acid generating tailings and wastewater into Cannery Creek, Tributary Creek, Greens Creek, and Hawk Inlet. We recommend that the SEIS evaluate a failure scenario for the TDF and consider including modelling results of hypothetical low and high catastrophic incidents. The modelling information should predict the magnitude, direction, and depth of the tailings discharge into the nearby drainages and the marine environment. We recommend that the modelling results be used to guide the development of management, mitigation, and monitoring measures to minimize the potential for a catastrophic TDF failure. We also recommend the SEIS include an Emergency Action Plan to demonstrate that there is capacity to respond to a potential catastrophic incident in the active mine area. Between 1993 and 1996, the Greens Creek Mine ceased operations for three years as a result of low metals prices. We recommend that the SEIS evaluate the potential for an unanticipated closure and/or cessation of the Greens Creek Mine operations, either temporary or permanent. In particular, the SEIS

[49] Alaska Department of Health and Social Services (March 23, 2016) Summary of Recommendations for the Consumption of Shellfish, Seaweed, and Harbor Seal from Hawk Inlet, dated February 26, 2016.
[50] 36 C.F.R. Part 800.

should discuss plans and mechanisms that would be implemented to ensure that the physical stability of mine facilities, such as the TDF, WRS areas, water treatment and ponds, the 920 mill area, and other mine structures are monitored and maintained and/or properly closed during a temporary and/or permanent closure or cessation. We recommend that the SEIS also discuss potential for abandonment and/or change in ownership/management of the Greens Creek Mine.

Physical Stability of Structures

We recommend that the SEIS evaluate the likelihood of seismic activities, such as earthquakes, which could result in tsunamis, landslides, and/or avalanches in the region and describe the geotechnical stability of the TDF, water treatment system and ponds, WRS areas, and other mine facilities during operations and closure. We recommend including a description of how these facilities are designed and how they would be operated, closed, and monitored to ensure physical stability. We note that previous stability analyses may not have included an evaluation of drainage and consolidation in peat layers and/or soft clays that may be present in the locations of the TDF, and water treatment system and ponds, and other mine facilities. If such peat and/or clay layers are present at the mine site, then we recommend that additional evaluations be completed and the results considered in pseudo-static analyses of slope and cover stability for this proposed action and alternatives. We recommend that the SEIS include a discussion regarding the drainage and consolidation of peat layers and/or soft clays at the mine site and the measures that would be taken to ensure the physical stability of mine site structures.

In addition, we recommend that a risk assessment, such as a Failure Modes and Effects Analysis, be conducted for the TDF, the water treatment system and ponds, as well as other major facilities at the Greens Creek Mine. The results of the FMEA should be summarized in the SEIS. An FMEA considers potential failure modes and identifies the relative likelihood and consequences of the failure modes, which are key considerations for impact assessment and developing alternatives and mitigation. We can provide examples of the use of FMEAs in other mining EISs if requested.

Hazardous Materials Management

We recommend that the SEIS address the potential direct, indirect, and cumulative impacts of hazardous materials/wastes management and storage from the construction and operation of the proposed project and alternatives. We recommend that the SEIS disclose the types and quantities of materials that will be used during implementation of the proposed project, describe the measures that will be taken to minimize the risks associated with an unanticipated accidental release, include the emergency measures that will be implemented should such an event occur and discuss how potential adverse impacts from spills may be mitigated by effective containment and cleanup operations.

Response Training and Planning

EPA recommends that the SEIS discuss training, exercises, and planning for responding to accidental spills of fuel, chemicals, wastewater, tailings, and other mining related materials. We recommend that the SEIS also discuss public notification and awareness, and the types of clean up supplies/equipment and pre-deployment of these supplies and equipment in the vicinity of the mine site. Furthermore, we recommend that response training, exercises, and planning include the nearby local communities of Angoon, Hoonah, Douglas, and Juneau.

Analysis Tools and Methodologies

Baseline Data Adequacy

We suggest categorizing and synthesizing existing data, information, studies, reports, monitoring results, etc. for the Greens Creek Mine to ensure information is available for use in the SEIS analysis. We recommend that workgroups include cooperating agency subject matter experts for key areas (air, water,

wetlands, fisheries, etc.) to review baseline data for completeness, identify data gaps, and recommend approaches toward resolving those gaps in a timely manner.

Predictive Modeling

We recommend that predictive modeling be based on site-specific conceptual models that describe the system boundaries, spatial and temporal scales, hydraulic (for water modeling) and chemical characteristics, sources of data and data gaps, and the mathematical relationships used to describe processes. In particular, water quality models should be capable of predicting both whole water and dissolved fractions of metals/metalloids and should provide temporal predictions that are consistent with the time-steps in applicable water quality criteria. We recommend that any modeling documentation include, but not be limited to:

- Tables of parameter values used in the model;
- Tables and graphs of results;
- Uncertainty and sensitivity analyses;
- Errors associated with both measured and assumed data; and
- Recommendations for further analysis, if applicable.

EPA recommends that discussions on modeling include a clear statement of the management objectives intended to be achieved, the level of analysis required to meet the objectives and uncertainties associated with modeled outcomes. We recommend review of the EPA's guidance for the effective development, evaluation, and use of models in environmental decision making.[51]

In addition, we recommend that the SEIS use caution in describing absolute outcomes based on modeling. Mathematical modeling used for describing the physical and chemical characteristics of the project site and potential impacts includes a level of uncertainty; understanding these uncertainties and associated risks is necessary for informed decision making. We also strongly recommend an appropriately conservative approach be taken with modeling and a range of predictive outcomes be discussed (e.g., most likely case, reasonable worst-case, and reasonable best-case scenarios) that reflect a range of climatic settings and critical input values. Inclusion of a reasonable range of outcomes allows the agencies to make better informed plans for mitigation, adaptive management, and contingencies to respond to reasonably foreseeable adverse impacts.

MITIGATION, MONITORING AND ADAPTIVE MANAGEMENT

Mitigation

NEPA regulations at 40 C.F.R. § 1508.20 define mitigation to include five categories of actions to address impacts. Briefly stated, these are: avoiding, minimizing, rectifying, reducing, and compensating. The regulations at 40 C.F.R. § 1502.14(t), 1502.l6(h), and 1508.25 indicate that appropriate mitigation measures should be addressed in an SEIS both as part of the analysis of alternatives and in discussions of environmental consequences.

We recommend that the SEIS identify the type of mining activities that would require mitigation measures during the construction, operation, and closure phases of this project. In addition, we recommend identifying whether implementation of these measures would be required by the Forest Service or any other governmental entity and which entity would be responsible for implementation. To the extent possible, we recommend that mitigation goals and measurable performance standards be identified to reduce impacts to a particular level or adopted to achieve an environmentally preferable

[51] Guidance Document on the Development, Evaluation and Application of Environmental Models (EPA/100/K-09/003, March 2009). See https://www.epa.gov/sites/production/files/2015-04/documents/cred_guidance_0309.pdf.

outcome. CEQ guidance on the Appropriate Use of Mitigation and Monitoring seeks to enable agencies to create successful mitigation planning and implementation procedures with robust public involvement and monitoring programs.[52]

Mitigation is also relevant to evaluating compliance with the CWA Section 404(b)(1) Guidelines, which prohibit discharges of dredged or fill material that cause or contribute to significant degradation to waters of the United States and all discharges "unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem."[53] Avoidance, minimization, and compensation form the "mitigation sequence" that must be followed in order to comply with the Guidelines' requirement that all appropriate and practicable steps be taken to mitigate impacts to aquatic resources.[54] We recommend that the SEIS include an evaluation of project avoidance, minimization, and compensatory mitigation for the proposed action and action alternatives. To ensure the NEPA analysis sufficiently addresses the direct, indirect, and cumulative adverse impacts to wetlands and aquatic resources from the project and supports the Guidelines analysis, we recommend that wetlands compensatory mitigation be evaluated in the SEIS. In particular, we recommend that a draft Wetlands Compensatory Mitigation Plan (CMP) be included in the SEIS as an appendix. We also recommend that the CMP include a wetlands functional assessment using the methods mentioned above and contain all the required elements described in Subpart J of the Guidelines and identified in the joint EPA/Corps Final Rule regarding *Compensatory Mitigation for Losses of Aquatic Resources*.[55]

The Corps, Alaska District, has developed a Credit Debit Methodology[56] as a tool to determine the sufficiency of compensatory mitigation to offset specific unavoidable losses to aquatic resources. We recommend that the Credit Debit Methodology be used to calculate (1) the mitigation debits resulting from this project's specific unavoidable impacts to wetlands and aquatic resources, and (2) the mitigation credits that would be required to compensate for the unavoidable adverse wetland impacts by purchase of credits from an approved mitigation bank and/or an approved In-Lieu Fee program within the Southeast Alaska service area. As required by the joint EPA/Corps Final Rule regarding compensatory mitigation, "the amount of required compensatory mitigation must be, to the extent practicable, sufficient to replace lost aquatic resource functions." This would include consideration of the temporal and spatial loss of wetlands and aquatic resources.

We note that the U.S. Department of Agriculture, Forest Service and the Corps, Alaska District, have entered into a Conservation Land Use Memorandum of Agreement for the purpose of establishing a mutual framework whereby projects providing compensatory mitigation requirements under the CWA Section 404 associated with Department of Army permits may be used to (1) preserve, protect, restore, enhance or establish aquatic resources on National Forest Systems (NFS) lands; and/or (2) contribute suitable lands or funding for suitable lands be incorporated in the NFS.[57] EPA would be available to work with the Forest Service, the Corps, and the applicant to evaluate options for compensatory mitigation and to review the CMP.

Furthermore, we recommend evaluation of permittee-responsible compensatory mitigation with the preference for in-kind and on-site and within watersheds affected by the mine operations. According to ADFG, Cannery Creek, which crosses the B Road near the TDF, does not support resident or

[52] See https:/ /ceq.doe.gov/docs/ceq-regulations-and-guidance/Mitigation _and_Monitoring_Guidance_14Jan2011.pdf.
[53] 40 C.F.R. § 230.10(d).
[54] 40 C.F.R. § 230.I0(a), (d); See Memorandum of Agreement between U.S. Department of Army and the Environmental Protection Agency on the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines.
[55] 33 C.F.R. § 332.4(c)(2)-(14)/40 C.F.R. § 230.94(c)(2)-(14).
[56] U.S. Army Corps of Engineers, Alaska District. (2016). *Alaska District: Credit Debit Methodology, Version 1.0.*
[57] Conservation Land Use Memorandum of Agreement Between U.S. Army Corps of Engineers, Alaska District and the U.S. Department of Agriculture, Forest Service, Tongass National Forest (November 2020).

anadromous fish populations, but suitable resident rearing, spawning and overwintering habitats exists.[58] We recommend that restoration and enhancement of Cannery Creek to support salmon rearing, spawning and overwintering habitat be evaluated as a form of compensatory mitigation and included in the draft CMP. This could include removal of historic dams within Cannery Creek.

Monitoring

Environmental monitoring programs should be designed to assess project impacts and effectiveness of implemented mitigation measures. We recommend that the monitoring programs:

- Define the monitoring goals and objectives;
- Provide details to demonstrate that goals and objectives will be achieved such as the parameters to be monitored, monitoring locations and frequency, data analysis, and reporting;
- Discuss actions (contingencies, triggers, adaptive management, corrective actions, etc.) that will be taken based on monitoring results;
- Identify and incorporate controls and pre-project data to enable detection of impacts, success of BMPs, and ability to distinguish these from natural variation; and
- Require regular analysis and reporting of data to oversight agencies.

We recommend that the monitoring programs be described and that the SEIS also discuss public participation and how the public can access information on monitoring results and mitigation effectiveness.

Adaptive Management Planning

We recommend that the SEIS utilize adaptive management and contingency planning to describe the strategy for responding to unforeseen circumstances at the site. The strategy could include "trigger levels" (e.g., exceedance of ecological benchmarks) or observations (e.g., statistically significant trends in indicators, permit violations, water balance problems, changes in discharge or chemistry of springs/seeps) that would set follow-up actions into motion. We recommend that this strategy or plan be described in the SEIS so that reviewers may comment. This type of plan, when coupled with the monitoring program, is necessary to mitigate for uncertainties and risks associated with predictions of environmental outcomes, and will provide an early warning system of unexpected outcomes.

Climate Trends

We recommend that the SEIS include a discussion of reasonably foreseeable future actions and effects that climate trends may have on the proposed project and the surrounding area, including long-term stability and resilience of the Greens Creek Mine infrastructure, such as the TDF, water treatment ponds and facilities, WRS areas, underground stopes and portal, water treatment facilities and discuss potential changes to environmental impact predictions made in the 2013 Final SEIS. This analysis would inform the development of measures to improve the resilience of the proposed project. If anticipated climate trends could notably exacerbate the environmental impacts of the project, we recommend that these impacts also be considered as part of the NEPA analysis and mitigation, monitoring, and adaptive management be included to address climate induced impacts to the Greens Creek Mine.

In Alaska, changes in climate may represent a significant impact to resources and project facilities, infrastructure, and operations and maintenance, resulting in additional costs to mitigate. For example, the Red Dog Mine, a zinc and lead mine in Northwest Alaska has been affected by thawing permafrost, which resulted in an additional expenditure of nearly $20 million on water storage and discharge

[58] Kanouse, KM and Fritz E (January 2020). Freshwater Resource Investigations Near Greens Creek Mine. Technical Report No. 19-01. Alaska Department of Fish and Game, Habitat Section.

management, including construction of a new WTP using reverse osmosis.[59] Permafrost thaw in the watershed surrounding the Red Dog Mine had been releasing higher natural levels of dissolved minerals and other particles into streams, which limited the mine's ability to discharge its treated wastewater into a permitted creek. This resulted in water backing up into its tailings reservoir. In 30 years of Red Dog operations, this was the first time that background levels in the creeks reached a point where it precluded additional wastewater discharges. To reduce water in the reservoir, corrective actions were taken that included pumping hundreds of millions of gallons of water out of the reservoir into the bottom of the mine's active open pit. The Red Dog Mine had to reduce ore production and mine lower-grade ore toward the top of the pit rather than higher-grade ore below. These lessons learned from the Red Dog Mine demonstrate that changes in climate are a significant impact to mine infrastructure and operations, resulting in additional costs and maintenance. In addition, we recommend evaluation of climate trends as a failure mode in the FMEA for this project. Financial assurance cost estimates should also reflect the risk that climate trends may have on closure and reclamation, and long-term monitoring of the mine infrastructure, including the TDF and water treatment system and ponds. We recommend that the SEIS evaluate adaptive management planning to ensure that plans are established to address the unforeseen impacts that climate trends may have on the Greens Creek Mine.

In 2011, the Forest Service released the *National Roadmap for Responding to Climate Change*. (FS-9576), which was based on a *Strategic Framework for Responding to Climate Change* (October 2008). We support the management actions identified in the National Roadmap to facilitate adaptation and mitigation for immediate and long-term changes to climate. We recommend that the SEIS evaluate changes in climate consistent with the Forest Services' National Roadmap. For planning and analysis to address climate change, the Forest Service would incorporate climate-related vulnerabilities and uncertainties into land management and project-level environmental analysis and discuss how a range of uncertainties in future climate conditions might affect the expected consequences of proposed activities. We also support the Forest Service in their commitment to implement effectiveness monitoring of management actions designed to facilitate adaptation and mitigation.

Financial Responsibility

NEPA provides for the disclosure of information concerning the environmental consequences of a proposed action to agency decision makers and the public before decisions are made and actions are taken. A key component in determining the environmental impacts of a mining project is the effectiveness of the post-closure and reclamation activities, including long-term management, maintenance, and monitoring. In turn, disclosure of information regarding whether necessary closure and reclamation activities will be adequately funded is key to determining whether those activities will be effective. We therefore recommend that the applicant's ability to self-fund, and/or any third-party financial responsibility mechanisms, be disclosed in the SEIS.

According to the ADEC Waste Management Permit (2020DB0001), the total financial responsibility cost estimates for the life of the permit is over $92 million. This includes over $77 million for reclamation and closure and over $14 million for long-term care and water treatment.[60] This financial responsibility would include long-term care and water treatment, including monitoring, maintenance, reporting, and labor. Financial responsibility cost estimates are reviewed every five years or upon renewal of permits. We note that a surety bond (#K08399232) was established for over $13 million to support reclamation and closure. In addition, Hecla would establish a trust fund for long-term post closure water treatment, monitoring, and periodic dam safety inspections.[61]

[59] Anchorage Daily News (September 2, 2020).
[60] Alaska Department of Environmental Conservation (February 20, 2020). Waste Management Permit (2020DB0001) for Hecla Greens Creek Mining Company.
[61] Memorandum of Understanding between the Alaska Department of Natural Resources, Alaska Department of Environmental Conservation, and the U.S.

We recommend that the SEIS disclose the present financial responsibility cost estimates, as well as estimates projected out ten years to account for the net present value and inflation, and proposed project changes associated with the NEP, including the expansion of the TDF and changes to water treatment and ponds. We recommend that the SEIS disclose the estimated costs to reclaim and close the site in a manner that achieves water quality goals and post-mining reclamation objectives. The EPA can be available for further conversations about the level of detail regarding financial responsibility cost estimates to be included in SEIS.

Department of Agriculture, Forest Service Concerning Reclamation/Closure/Post-Closure Bonding for the Greens Creek Mine (2019).