



**U.S. Army Corps  
of Engineers  
Alaska District**

**Department of the Army**

**Permit Evaluation and Decision Document**

**APPLICANT:** Alaska Gold Company (A.K.A. NovaGold Resources Inc.)

**APPLICATION NO.:** POA-2006-742-M

**WATERWAY:** Rock Creek

This document constitutes my Environmental Assessment, Public Interest Review, Section 404(b)(1) Guidelines Review and Compliance Determination, and Statement of Findings for the proposed work.

The following documents were among those considered, reviewed, and independently evaluated and are hereby incorporated by reference:

Preliminary Jurisdictional Determination for Rock Creek, December 29, 2003 and updated January 18, 2004, prepared for Alaska Gold Company by HDR Alaska, Inc.

Preliminary Jurisdictional Determination for Big Hurrah, June 16, 2005, prepared for Alaska Gold Company by HDR Alaska, Inc.

Rock Creek Project Tailings Alternatives Analysis Final Report (Tailings Alternatives Analysis), November 10, 2004, prepared for Alaska Gold Company by Smith Williams Consultants, Inc.

Rock Creek Project Preliminary Plant Site Alternatives Analysis Memos (Preliminary Plant Site Alternatives Analysis), August 27, 2004, prepared for Alaska Gold Company by Smith Williams Consultants, Inc.

Rock Creek Project Plant Site Alternatives Analysis Final Report (Plant Site Alternatives Analysis), December 4, 2006, prepared for Alaska Gold Company by Smith Williams Consultants, Inc.

Rock Creek Mining Project Wetlands Delineation for Alaska Gold Company in Nome, Alaska, 2007 Amendment to Originally Submitted 2004 PJD Memorandum, February 12, 2007, to Charlotte MacCay from Brandy Bland of HDR Alaska, Inc.

Rock Creek Revised Wetland Disturbance Areas and Volumes Memorandum, February 14, 2007, to Charlotte MacCay from Ryan T. Baker, P.E., of Smith Williams Consultants, Inc.

Rock Creek Mine Project, U.S. Army Corps of Engineers 404 Permit Application, Appendix 2 – Revised February 14, 2007, Summary of Fill and Disturbance Areas Excerpts from Rock Creek Mine Plan of Operations.

Rock Creek Plan of Operations:

- Volume 1 Project Description
- Volume 2 Environmental Information Document (EID)
  - Appendices:
    - Archeological and Cultural Resources
    - Biological Resources
    - Climate
    - Geology-Geochemistry
    - Hydrology
    - Socio-Economic
    - Visual

- Volume 3 Waste Management Plan
  - Waste Management Plan Rock Creek Mine/Mill Complex
  - Big Hurrah – Development Rock Handling Plan
  - Inert Waste Disposal Operations Plan
  - Tailings Storage Facility Operations and Maintenance Manual
  - Hazardous Materials Plan
- Volume 4 Reclamation Plan
- Volume 5 Water Management Reports
- Volume 6 Thermal and Seepage Evaluation
- Volume 7 Monitoring Plan
- Volume 8 Geochemistry and Groundwater Reports

State Authorizations:

- Alaska Department of Environmental Conservation (ADEC) Waste Management Permit
- Alaska Department of Natural Resources (ADNR) Temporary Water Use Authorizations
- ADNR Office of Habitat Management and Permitting (OHMP) Fish Habitat Permit
- ADNR Rock Creek and Big Hurrah Mine Project Final Reclamation Plan and Approval
- ADNR Office of Project Management and Permitting (OPMP) Coastal Zone Consistency Determination
- ADNR Certificate of Approval to Construct a Dam
- ADEC 401 Water Quality Certificate of Reasonable Assurance (ADEC 401 Certificate)

Responses to Comments:

- ADNR Responses to Comments on Draft Authorizations for Rock Creek
- Draft Responses to Comments from Alaska Gold Company

Comments Received in Response to United States (U.S.) Army Corps of Engineers (Corps), Alaska District Public Notice, dated June 1, 2006.

In addition, there were numerous (59 documented) iterative meetings from 2003 through 2006 with the State's Large Mine Permitting Team (LMPT), which includes ADEC, ADNR Division of Mining, Land, and Water, ADNR OHMP, and ADNR OPMP. The United States Environmental Protection Agency (EPA) and the Corps participated in many pre-application meetings with the Alaska Gold Company and the LMPT. Much of the discussion at these meetings centered on alternative designs for the proposed facilities that would avoid and minimize impacts to waters of the U.S., including wetlands, as well as ensuring that baseline data were comprehensive and accurate. Memorandum from Steve J. McGroarty, State of Alaska Division of Mining, Land, and Water to Stan Foo, Mining Section Chief, State of Alaska Division of Mining, Land, and Water, October 30, 2003.

**1.0 Authority**

This permit action is being taken under authority delegated to the District Commander by 33 CFR 325.8, pursuant to:

- Section 10 of the Rivers and Harbors Act of 1899
- Section 404 of the Clean Water Act
- Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972

**2.0 Proposed Project**

**2.1.1 Background of Region:**

Since the first strike on Anvil Creek, Nome's gold fields have been mined by individuals, corporations, with large floating bucket line dredges, ground sluices, suction dredges, and mechanized open pit placer mines. The creeks near Nome that have been mined for placer gold include: Anvil Creek, Big Hurrah Creek, Bonanza Creek, Eldorado Creek, Upper Dry Creek, Cripple Creek, Canyon Creek, Tripple Creek, Specimen Gulch, Iron Creek, Airport Creek, Gold Run Creek, Rock Creek, Darling Creek, Gold Creek, etc. Five mining districts surrounding Nome have produced over 5.2 million ounces of gold since 1898.

Today Nome has a permanent population of 3,500 residents, and is an isolated community with no connection to the rest of Alaska via road or railroad. All supplies and equipment must come through the Nome airport or the marine port (ice-free only 5 months a year). There is no all-season overland access to any major population center. The economy of Nome is driven by government, tourism, transportation, mining, and as a service hub for the region. The recent upswing in metals price has led to resurgence in mineral exploration and placer mining in the Nome region (composed of the Nome, Solomon, and Bendeleben U.S. Geological Survey quadrangles).

The uplands and waters of the U.S. within the proposed project site are similar in nature to much of the area of this region, and therefore are not unique within the geographic area of the region. Similarities include: vegetation, substrate, water resources, wildlife, fish, topography, population density, climate, and previous land use activities, specifically extensive mining. Willow habitat exists within the project area and throughout the region and has been identified as higher value habitat.

Additional information is available from the Nome Convention and Visitor's Bureau.

## 2.1.2 Project Description:

**NOTE: Fill quantities and the area impacted at the Rock Creek Mine/Mill Complex have changed from those in the permit signed on 21 August 2006. As a result of the lawsuit and permit suspension and our directive that no new work could be performed in wetlands, the applicant independently decided to have their consultants confirm the wetland mapping. Their consultants discovered both drafting errors in the permit drawings and that the stream diversions and organic overburden stockpile #3 extended into four small areas beyond the original project boundary. The drafting errors incorrectly showed wetlands within the Tailing Storage Facility (TSF) and access and haul roads which were in fact uplands. The consultants also mapped the wetlands in the four small areas beyond the original project boundary (a total of 9.5 acres). The Corps has reviewed this information and has confidence that the revised mapping is correct. There have been no changes to the facility layout from that described and depicted in the Public Notice. In addition, the impacts to the 9.5 acres of wetlands are temporary. The permanent loss of wetlands decreases from the originally permitted amount of 248 acres to 170.5 acres because the revised mapping shows that there are fewer wetlands impacted at the North Development Rock Dump, TSF, and the access and haul roads (a total reduction of 77.5 acres). The Corps believes these revisions would not have resulted in any material difference in our analysis. The data that have been revised are indicated with an \*.**

The Rock Creek Mine Project is the overall project name, which includes both the Rock Creek Mine/Mill Complex and the Big Hurrah Mine. The proposed project is located entirely on land owned by the Alaska Gold Company or leased from Native Corporations for the express purpose of constructing a mining operation. The Rock Creek Mine Project is comprised of two open pit mines and facilities at two locations: the Rock Creek Mine/Mill Complex located approximately 6 road miles north of Nome in the Snake River watershed and the Big Hurrah Mine located 42 road miles east of Nome in the Solomon River watershed. Approximately 15,592,411\* cubic yards (cy) of fill would be placed in 346.5\* acres of wetlands for the project.

The Rock Creek Mine/Mill Complex would consist of a 3,445 feet x 1,312 feet (50 acres) open pit gold mine, a gold recovery plant, a paste tailings storage facility, and two non-acid generating development rock stockpiles. Development rock (waste rock removed in order to access the ore body) was tested to determine whether the rock was potentially acid generating (PAG) or non-acid generating (NAG), see Section 6.1.17 (Volume 8 Geochemistry and Groundwater Reports, Technical Memorandum, dated March 27, 2006; EID, 7.3.2 Acid Rock Drainage and Metal Leaching Potential, pp 45-50). The process plant site area would include a three stage crushing and screening plant, a crushed ore stockpile, a mill facility, a maintenance shop, an administration and mine dry building, warehouse, explosive storage and fuel storage. The North Stockpile area would contain approximately 6,320,000\* cy of fill in 83\* acres of wetlands. The South Stockpile would not be located in wetlands. Three Organic Overburden Stockpile Areas for the site would contain 2,362,740\* cy of fill in 62\* acres of wetlands. The site stormwater diversion channels would be constructed in 28\* acres of wetlands with approximately 75,000\* cy of fill. The Class V Injection System-Wells would be constructed in 7.5 acres of wetlands with approximately 32,700 cy of fill. The Class V Injection System-Gallery would be constructed in 8.5 acres of wetlands with

60,000 cy of fill. The TSF would be constructed in 77\* acres of wetlands and contain 6,350,000\* cy of fill and be used to store mill tailings and act as a storm water runoff buffer. The access road and on-site haul roads would be constructed in 25\* acres of wetlands with 150,000\* cy of fill material. The Infiltration Zone Access Roads would be constructed in 6 acres of wetlands with 45,778 cy of fill material. The Plant Area would be constructed in 44.5 acres of wetlands with 117,716 cy of fill material. A power line linking the Rock Creek Mine/Mill Complex to the Nome Joint Utilities will be placed within the existing Glacier Creek Bypass Road right-of-way. The Rock Creek Mine/Mill Complex would impact 341.5\* of the 346.5\* acres proposed for the Rock Creek Mine Project.

The Big Hurrah Mine facilities would include an open pit gold mine [1,640 feet x 820 feet (22 acres) main pit and 656 feet x 328 feet (3 acres) satellite pit], a run-of-mine ore stockpile, a truck maintenance shop, a small administration and mine dry building, explosive storage and diesel fuel storage, a non-acid generating development rock stockpile, and a temporary potentially acid generating development rock stockpile that would be backfilled into the pit at closure (Volume 8 Geochemistry and Groundwater Reports, Technical Memorandum, dated May 8, 2006; EID, 7.3.2.2 Consequences, pp. 51-52). Ore from the Big Hurrah Mine would be trucked to the Rock Creek Mine/Mill Complex for processing; consequently, there would be no need for a TSF at the Big Hurrah Mine. The only site feature in wetlands would be the upgrading of the existing Big Hurrah Mine access road. This would entail the placement of 78,477 cy of fill material into 5 acres of wetlands. Portions of the 2.2 mile Big Hurrah Mine access road would require the placement of fill into wetlands to increase sight distances around corners to improve safety on the road and move the existing road out of the Big Hurrah Creek. The mine pit would be located in historic placer tailings, which changed the area from waters of the U.S. to uplands because tailings from previous gold mining were placed into waters of the U.S. Placer mining is defined as the removal of ore, in this case gold, from *placers*, which are glacial or alluvial deposits of sand or gravel containing valuable minerals. Little Hurrah Creek was extensively placer mined historically and the placer tailings were deposited in the creek channel such that it no longer has a defined channel. The proposed mitigation would remove the placer tailings (removed tailings would be used to construct the Big Hurrah Mine access road) and the proposed reclamation plan would re-establish the channel of Little Hurrah Creek from upstream of the mine pit to the connection with Big Hurrah Creek. The Big Hurrah Mine would impact 5 of the 346.5\* acres of wetlands proposed to be filled for the Rock Creek Mine Project.

#### SUMMARY OF IMPACTS

	Acres	Net Loss of Waters of the U.S.
<b>ROCK CREEK MINE PROJECT IMPACTS</b>		
Rock Creek Mine/Mill Complex and Big Hurrah	346.5*	346.5*
<b>AFTER MINE RECLAMATION</b>		
Organic Overburden Stockpiles	62.0*	
Water Management Systems	44.0*	
<b>Wetlands Reclaimed</b>	<b>106.0*</b>	240.5*
<b>AFTER MITIGATION</b>		
Big Hurrah Creek	29.0	
Both Pit Lakes	41.0	
<b>Waters of the U.S. Created</b>	<b>70.0</b>	170.5*
<p><b>NOTE: 106.0 acres of Waters of the U.S. are reclaimed and 70.0 acres of Waters of the U.S. are created as mitigation, resulting in a permanent net loss of 170.5 acres of Waters of the U.S. (346.5 - 106.0 = 240.5 and 240.5 - 70.0 = 170.5)</b></p>		

For more information including maps, tables, and figures, see Plan of Operations: Project Description Volume 1.

#### 2.2 Location:

The Rock Creek Mine/Mill Complex is located within sections 14, 15, 22 - 26, Township 10 South, Range 34 West, Kateel River Meridian; Latitude 64.6160° North, Longitude 165.4550° West; Snake River watershed, 7 miles northwest of Nome, Alaska. The Rock Creek Mine/Mill Complex can be accessed via the existing Glacier Creek Bypass Road.

The Big Hurrah Mine project site is located within sections 2, 3, 10, and 11, Township 10 South, Range 28 West, and section 34, Township 9 South, Range 28 West, Kateel River Meridian; Latitude 64.6460° North, Longitude 164.2380° West; Solomon River watershed, 42 miles northeast of Nome, Alaska. The Big Hurrah Mine site can be accessed via the existing Nome-Council Highway, and the existing 2.2 mile Big Hurrah Mine access road.

### 2.3 Scope of Analysis:

Pursuant to Department of the Army (DA) regulations at 33 Code of Federal Regulations (CFR) Part 325, Appendix B 7.b. *Scope of Analysis*, when a permit applicant proposes to conduct an activity which includes both regulated activities (e.g. fill in waters of the U.S. subject to Section 404 of the Clean Water Act) and non-regulated activities (e.g. fill in uplands); the District Commander (DC) must establish the scope of the environmental assessment to address impacts of the specific activity requiring a DA permit and those portions of the entire project over which the DC has sufficient control and responsibility to warrant Federal review. This control and responsibility over portions of the project beyond DA jurisdiction exists when the Federal involvement turns an essentially private action into a Federal action for purposes of the National Environmental Policy Act review. These are cases where the environmental consequences of the larger project, including activities in uplands, are essentially a product of the DA permit action.

Factors typically considered to determine whether there is sufficient control and responsibility over other portions of a project or the entire project include the following:

1. Whether the regulated activity comprises “merely a link” in a corridor type project (e.g. a transportation or utility transmission project).
2. The extent to which the entire project will be subject to Corps jurisdiction.
3. Whether there are aspects of the upland facility in the immediate vicinity of the regulated activity which affect the location and configuration of the regulated activity.
4. The extent of cumulative Federal control and responsibility.

Our consideration of these four factors and our determined Scope of Analysis for National Environmental Policy Act (NEPA) purposes are as follows.

1. Whether the regulated activity comprises “merely a link” in a corridor type project (e.g. a transportation or utility transmission project).

The Rock Creek Mine/Mill Complex is not a corridor type project; therefore, this factor does not apply. The Rock Creek Mine/Mill Complex is not part of a larger transportation system or utility system. The Corps jurisdiction for the Rock Creek Mine/Mill Complex is not a single stream crossing in a linear project such as found with pipelines or utility projects.

The Big Hurrah Mine portion of the Rock Creek Mine Project is a corridor type project. It involves the placement of fill into 5 acres of wetlands for the upgrade of the existing Big Hurrah Mine access road to the Big Hurrah Mine site. The Big Hurrah Mine site is currently accessible via the existing road. Mining can occur here without the placement of fill into wetlands, but would not meet Mine Safety and Health Administration (MSHA) minimum access road safety requirements.

2. The extent to which the entire project will be subject to Corps jurisdiction.

For the proposed Rock Creek Mine Project, work requiring DA authorization is limited to the mechanized land clearing of and the placement of fill material into approximately 346.5 acres of waters of the United States as part of the construction of the mine and mill facilities, including mine pit, development rock stockpiles, organic overburden stockpiles, tailing storage facility, water management systems, haul roads, and ancillary building pads.

The Corps has sufficient control and responsibility over private actions at the Rock Creek Mine/Mill Complex to warrant federal review of the entire complex under NEPA, for the following reasons:

- a. The total project area is 1,298 acres, of which 341.5 are waters of the U.S subject to Corps jurisdiction.
- b. Although upland fill is not subject to the jurisdiction of the Corps, fill would not be placed in uplands but for the placement of fill into waters of the U.S., including wetlands.

The Corps does not have sufficient control and responsibility over private actions at the Big Hurrah Mine to warrant federal review under NEPA, for the following reasons:

- a. The total project area is 95 acres, of which 5 are waters of the U.S subject to Corps jurisdiction.
  - b. Due to topography at the Big Hurrah Mine site, development rock can be placed in uplands, which is not subject to the jurisdiction of the Corps.
  - c. The placement of fill into wetlands at the Big Hurrah Mine site is solely for the purpose of upgrading the existing Big Hurrah Mine access road for safety reasons.
3. Whether there are aspects of the upland facility in the immediate vicinity of the regulated activity which affect the location and configuration of the regulated activity.

At the Rock Creek Mine/Mill Complex, there are no upland locations where mine components could be moved that would reduce the footprint of the project in wetlands. The Rock Creek ore body is partially located within waters of the U.S., i.e. in Rock Creek.

At the Big Hurrah Mine, access has been in place and disturbed for over 50 years, and the placement of fill into waters of the U.S. would be to upgrade and widen the existing Big Hurrah Mine access road for safety reasons. This factor is not sufficient to warrant federal review of the entire Big Hurrah Mine under NEPA.

4. The extent of cumulative Federal control and responsibility.

In determining whether sufficient cumulative involvement exists to expand the scope of Federal action, the DC shall consider whether other Federal agencies are required to take Federal action under other environmental review laws and executive orders.

The mechanized land clearing and the placement of fill material in waters of the U.S. as part of the construction of the Rock Creek Mine Project are regulated activities by the Corps under Section 404 of the Clean Water Act. This discharge of fill into waters of the U.S. for construction of the TSF is also regulated by the Corps under Section 404. These actions are being reviewed as part of the proposed project.

The Federal government is not funding any portion of the proposed project, nor is a Federal agency the land manager. The open pit mine and all facilities, stockpiles, and development rock dumps are all on Native Corporation and private land, and all proposed construction and operations will be by private entities. The primary access road is on Native Corporation and private land. Air quality, water quality, reclamation bond, and waste management are all primarily within the State's responsibilities.

The proposed Rock Creek Mine Project will be required to verify with the EPA that the project complies with the Section 402 of the Clean Water Act National Pollutant Discharge Elimination System (NPDES) Storm Water Multi-Sector General Permit (MSGP) for Industrial Activities. The requirement for verification of compliance with the EPA's Storm Water MSGP for Industrial Activities is part of the cumulative Federal control and responsibility for the Rock Creek Mine Project.

The proposed project will also require the following federal authorizations:

- a. A Bureau of Alcohol, Tobacco, Firearms, and Explosives (BATFE) Permit and License is required for use of explosives.
- b. An approved Stormwater Pollution Prevention Plan (SWPPP) plan must be filed with EPA.
- c. Under the Emergency Planning and Community Right-to-Know Act (EPCRA), hazardous spill reports must be given to the National Response Center (U.S. Coast Guard and EPA).
- d. MSHA requirements under the Federal Mine Safety and Health Act of 1977 must be followed.
- e. The United States Department of Transportation (USDOT) has regulatory requirements for the transportation of cargo, fuel, hazardous materials, including cyanide.

These authorizations do not constitute a substantial level of Federal control over the proposed project.

Other potential Federal involvement which could affect DA control and responsibility include laws applicable to agency coordination efforts (e.g., the Endangered Species Act, Fish and Wildlife Coordination Act, National Historic Preservation Act, and other environmental laws and executive orders). The Corps will comply with these statutes and applicable regulations.

#### Determined Scope of Analysis

Due to the DA control and responsibility associated with the Rock Creek Mine/Mill Complex, the scope of analysis for this proposed action will include the alternatives, impacts, and project benefits and detriments resulting from the proposed work in both wetlands and uplands.

Because there is insufficient DA control and responsibility associated with the Big Hurrah Mine, the Corps will only analyze the impacts on waters of the U.S., including wetlands, associated with upgrading the existing Big Hurrah Mine access road.

For the purposes of NEPA, reasonably foreseeable project-related impacts will be summarized and/or identified in the secondary and cumulative sections of this document.

#### **2.4 Purpose and need:**

Applicant's stated purpose and need: "Operate an open pit mine that produces a target of 82% or greater in the form of gold dore bars with a potential for the remainder to be produced as gold concentrate." See DA permit application, dated May 29, 2006.

Basic project purpose and water dependency [40 CFR 230.10(a)(3)]: The basic project purpose of a mine is to recover precious metals. This is not a water dependent activity. The project is partially sited in a special aquatic site, jurisdictional wetlands; therefore, pursuant to 40 CFR 230.10(a)(3), practicable alternatives not involving special aquatic sites are presumed to be available and are presumed to have less adverse impact on the aquatic ecosystem unless clearly demonstrated otherwise. Alternatives will be discussed below in section 3.0.

Overall project purpose: The Corps believes that the applicant's stated purpose and need (above) unduly limited the range of alternatives that could potentially be evaluated; therefore, the Corps has redefined the overall project purpose as follows: The overall project purpose is to construct a viable mine and mill to recover precious metals from the Rock Creek and Big Hurrah ore bodies.

#### **2.5 Site description:**

"The Snake River valley is presently accessed for mining; subsistence hunting, fishing, and gathering; recreational cabins; bird watching; dog mushing; and, general sight seeing. Access is via the Glacier Creek Highway...The Solomon River is accessed for hunting and fishing, and use of recreational cabins. Access is via the Nome/Council Highway," (EID, 7.2.1.1 Affected Environment, p. 39-40). Historically,

portions of the Snake River watershed, including Rock Creek and Glacier Creek, and portions of the Solomon River watershed, including Big Hurrah Creek and Little Hurrah Creek, have been placer mined. These mining activities have altered the drainages from their original conditions. The applicant has proposed reclamation that would restore the drainages to more natural conditions. Also, a full background summary of several aspects of the site description is presented in "EID, 7.0 Affected Environment and Consequences", pp. 38-314.

**3.0 Alternatives Considered** [33 CFR 320.4(b)(4), 40 CFR 230.10]

As defined in the Section 404(b)(1) Guidelines [40 CFR 230.3(q)], 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 the overall project purpose.

The following alternatives were evaluated as a result of discussions with the LMPT; Memorandum from Steve J. McGroarty, Professional Engineer ADNR Division of Mining-Fairbanks, to Stan Foo, ADNR Division of Mining, dated October 30, 2003, Subject: Rock Creek Project; personal communications with Victor Ross, Regulatory Lead Project Manager; and evaluation of the Rock Creek Plan of Operations documents.

**Summary of Alternatives**

<b>Alternative</b>	<b>Rejected or Accepted</b>	<b>Rationale</b>
3.1 No Action	Rejected	Permit denial. No mitigation or reclamation opportunities.
3.2.1 All Uplands	Rejected	Uplands too steep – stability issues and massive cuts would increase material to be discharged resulting in greater impacts
3.2.2 Alternative Component Placement	Rejected	Applicant's proposed plan is the least damaging alternative
3.2.3 Avoidance of High Value Habitat	Accepted	Avoid moose and avian habitat to maximum extent
3.2.4 Tailings Storage Facility Paste Tailings	Accepted	Reduces footprint
3.2.4 Tailings Storage Facility Subaqueous	Rejected	Larger footprint
3.2.4 Tailings Storage Facility Dry Stack	Rejected	Cost prohibitive
3.2.5 Mills at both Big Hurrah and Rock Creek	Rejected	Cost prohibitive and lack of electricity to Big Hurrah
3.2.5 High grade milling at Big Hurrah	Rejected	Cost prohibitive
3.2.5 Mill at Big Hurrah only	Rejected	Cost, logistics, and lack of electricity
3.2.5 Mill at Rock Creek only	Accepted	Proximity to larger Port, power/electricity and ore volume
3.2.6 Back hauling from Rock Creek to Big Hurrah	Rejected	Cost and Logistics
3.2.7 No Cyanide	Rejected	Not economic due to low gold recovery
3.2.8 Applicant's Pit Design	Accepted	Meets Safety requirements and maximizes ore recovery
3.2.8 Other Pit Designs (Steeper pit walls)	Rejected	Fails to meet safety requirements
3.2.9 Applicant's Development Rock Stockpile Design	Accepted	Stable and capable of reclamation
3.2.9 Other Development Rock Stockpile Designs (Stacked higher and/or steeper)	Rejected	Cost, logistics, safety

3.3.1 Move All Facilities to Big Hurrah (Uplands)	Rejected	Inadequate space in uplands would necessitate expansion into wetlands
3.3.2 Alternate Mill Locations (Closer to Nome, Airport Property, Dry Creek)	Rejected	Cost, logistics, safety
3.3.3 Applicant's Access Road to Big Hurrah	Accepted	Minimizes wetland impacts
3.3.3 Alternative Locations of Access Road to Big Hurrah	Rejected	No legal access and increases wetland impacts
3.3.4 Other Mine Sites	Rejected	Quantity of ore bodies in other locations were economically unfeasible
3.3.5 Tailings Dam in Rock Creek Floodplain	Rejected	Remobilization of tailings downstream, increased impacts to waters of the U.S.
3.4 Different Haul Methods	Rejected	Cost, logistics, and increased impacts

**3.1 No action:**

The no action alternative would result in denial of the DA permit. Under the no action alternative the project would not be constructed and there would be no disturbance to 346.5 acres of jurisdictional wetlands. However, fishery enhancement potential with the proposed mitigation projects would not occur. Also, the no action alternative would remove the potential for economic growth associated with mine development. This alternative would be less environmentally damaging, but it would not be practicable since it would not meet the overall project purpose.

See EID, 6.3 Alternative 3 (No Action Alternative), pp. 37-38 for additional information.

**3.2 Other project designs:**

**3.2.1** Placement of the mine and all facilities in uplands is not practicable. The location of the pit is limited to where the ore body, a mineralized zone with defined limits capable of being mined, exists. The Rock Creek ore body is not located entirely within uplands; therefore, some work must be done in wetlands. The uplands in the project area have grades of 15% to 38%, which is too steep for the placement of facilities or storage of development rock, and therefore, not practicable. There is not enough space in uplands due to steep topography to site all facilities in uplands, which would require massive cuts and generate more development rock that would necessitate additional space for disposal. This alternative would be cost-prohibitive for the applicant. Deposition of the rock onto steep slopes would create an unstable landform/facility. Additionally, winter operation in steep terrain creates safety concerns with road travel and the ice and snow 8 months of the year. Development rock stockpiles at Big Hurrah Mine were designed to avoid the placement of fill into waters of the U.S., including wetlands.

**3.2.2** The Corps and the LMPT reviewed and discussed alternative component placements during pre-application consultations with the applicant while they were formulating their proposed project plan. At these pre-application consultations, the Corps stressed to the applicant the requirement to avoid and minimize wetland impacts to the maximum extent practicable. The Corps is satisfied that the applicant's proposed plan and configuration reflects a minimization of the overall footprint and avoidance of wetlands where practicable. Roads and foundations would be constructed from fill that consists of development rock and historical placer tailings; thus, further minimizing disturbance to waters of the U.S. by not developing new material sites (sites excavated to obtain fill for construction). The proposed project design would not involve construction of a personnel camp, which would further reduce the footprint of disturbance in waters of the U.S. The Corps could not identify any rearrangement of components that further minimizes wetland impacts. Based on the information provided, the Corps determined that there are no other project designs that would be less environmentally damaging and practicable.

See EID, 6.1.2 Selection Rationale, p. 36 and Plant Site Alternatives Analysis for additional information.

**3.2.3** The applicant considered different component placement based on wetland, stream, and habitat mapping. High-value habitats were determined primarily based on moose and avian usage. The Corps, USFWS, and the LMPT concurred that the applicant's proposed plan minimized impacts to high-value habitats.

See EID, 7.7 Biological Resources, pp. 207-219 for additional information.

**3.2.4** The original proposal for a tailings storage facility included the use of sub-aqueous tailings disposal at 35% solids (e.g., placing tailings under water behind a man-made dam). After discussions with the Corps, EPA, and LMPT, the applicant proposed a paste tailings disposal system which is 72 – 75% solids. The paste system results in the use of less water, less water that has to be treated, and a smaller footprint for tailings storage, thereby reducing the amount of wetlands impacted.

See Tailings Alternatives Analysis for additional information.

**3.2.5** The applicant reduced the number of facilities by proposing the use of only one mill site at the Rock Creek Mine/Mill Complex. High grade milling at the Big Hurrah Mine as well as milling only at Big Hurrah Mine were considered but rejected as cost-prohibitive. Currently, both mine sites are without electricity. Bringing electricity from the grid in Nome 40+ miles to Big Hurrah was rejected in favor of routing power approximately 6 miles to Rock Creek. Furthermore, there is not enough space in uplands due to steep topography to store the development rock and tailings in uplands at a potential Big Hurrah Mine/Mill. Expansion outside the uplands would require the placement of development rock and tailings into undisturbed wetlands not currently proposed for fill. Consequently, this alternative would not be less environmentally damaging. Expansion upstream of the Big Hurrah Mine would also require disturbance of wetlands previously not impacted by placer and hard rock mining. Expansion downstream of the Big Hurrah Mine would increase impacts to waters of the U.S., specifically, Big Hurrah Creek. The placement of facilities in Big Hurrah Creek would adversely impact proposed mitigation. Due to costs and logistics, these alternatives were determined not to be practicable by the Corps.

**3.2.6** Hauling development rock and tailings back to the Big Hurrah Mine site from the Rock Creek Mine/Mill Complex was considered and rejected. Additional costs would result from double-handling the material. Logistically, there is not enough useable space in uplands to place the development rock and tailings at the Big Hurrah Mine site. Expansion outside the uplands would require the placement of development rock and tailings into previously undisturbed wetlands. This alternative has been determined not to be practicable by the Corps because of costs and logistics.

**3.2.7** Processing the ore without the use of cyanide was the first milling alternative proposed by the applicant. Bulk sampling of the ore bodies and the pilot mill test determined that cyanide would aid in the recovery of the gold, and is necessary to make the project economically viable. After crushing and grinding, the ore bearing rock would go through gravity separation, and then floatation which is anticipated to remove approximately 87% of the ore. Approximately 13% of the ore bearing rock would go through the cyanide recovery process (both cyanide and gold are recovered). Any residual cyanide within the tailings is then chemically neutralized within the mill. Paste tailings are discharged to the TSF, meeting State standards.

See EID, 6.2 Alternative 2, p. 37 and ADEC Waste Management Permit for additional information.

**3.2.8** The pit designs at both sites are based on economics, groundwater hydrology, rock mechanics, geology, and assays of the ore bodies. The applicant's proposed design maximizes ore recovery with a pit design that meets MSHA safety requirements. At Big Hurrah Mine, the applicant would backfill the satellite pit with development rock using that foundation as a pad for the ore stockpile from the main pit to minimize impacts to waters of the U.S.

See Project Description Volume 1, Section 3.2 Pit Designs, pp. 9-10 for additional information.

**3.2.9** Options to stack development rock higher or steeper, which would reduce impacts to waters of the U.S., were rejected because they did not meet safety standards for stability. Stability of the development rock stockpiles would be adversely affected by seismic hazards and/or steeper slope configuration. Development rock stockpiles at both the Rock Creek Mine/Mill Complex and Big Hurrah Mine were designed to avoid placement within the local creeks. Stacking development rock higher or steeper was determined by the Corps to not be practicable due to logistics and cost.

See EID, 6.1.2 Selection Rationale, p. 36 for additional information.

### **3.3 Other sites:**

**3.3.1** Placement of mill complex, tailings storage facility, and development rock stockpiles only at the upland Big Hurrah Mine is not practicable because the topography (steep grades) limits the footprint of facilities in the area to only support development rock stockpiles and a mine pit, not the remainder of the mill facilities. EID, Figure 5.4 Big Hurrah Site Layout Map depicts the contour lines surrounding the proposed Big Hurrah Mine site and it is evident that enlarging the existing footprint would require the placement of fill into undisturbed waters of the U.S. Also, no electricity exists at the Big Hurrah Mine site. Consequently, the Corps determined that this alternative is not practicable due to logistics.

See EID, 5.2 Big Hurrah Mine Overview, p. 28 for additional information.

**3.3.2** Alternative mill locations to the proposed Rock Creek Mine/Mill Complex were considered. Site locations included previously developed property close to the city of Nome, other property currently owned by the applicant (Dry Creek, dredge #5), and airport property. These alternative sites would increase traffic in the Nome area. Results of increased traffic in and around Nome would include increased noise, increased dust generation, increased traffic congestion, and result in community safety conflicts. In addition, locating the mill, which would use cyanide, closer to town would not be acceptable to the community. The Corps determined that these mill sites were not practicable for environmental, social, economic, and/or safety reasons; e.g. they were not less environmentally damaging and were not practicable due to cost and logistics.

The applicant's preferred mill location takes into consideration water availability, the distance from the location of the main ore body to the mill, power, road access, site availability (space), and property ownership. The applicant's preferred mill location, the Rock Creek Mine/Mill Complex, met these site selection criteria, while minimizing impacts to high-value habitat through consultation with the U.S. Fish and Wildlife Service and Corps.

See EID, 6.1.2 Selection Rationale, pp. 35-37 for additional information.

**3.3.3** Alternative access from the Nome-Council Highway to the Big Hurrah Mine was reviewed but rejected as a result of discussions between the Corps and the applicant. The existing pioneer road is a previously constructed trail, and if a new road were constructed, it would not follow the legal access to the Big Hurrah Mine. The existing alignment of the trail was selected to minimize wetlands impacts; other locations (for example, relocating the road on the opposite side of the valley) that were assessed would have required the placement of additional fill into waters of the U.S. Therefore, the Corps determined that relocation of the road would be more environmentally damaging and is not practicable due to costs and logistics.

**3.3.4** Regarding other sites for a mine; the applicant explored, and continues to explore, areas in the Nome region for precious metals, primarily gold. The preferred mine pit locations at Rock Creek and Big Hurrah were chosen based on detailed geologic mapping and exploratory drilling programs. Exploration determines the exact location of the ore body; and then the applicant refined the mine pit boundaries to minimize unnecessary impacts. Requiring the applicant to construct a gold mine where there is not a known ore body would not be practicable as it would not meet the overall project purpose.

**3.3.5** The original proposal for a tailings storage facility included placing a dam across Rock Creek and using the depression area of the creek bottom for the tailings disposal. After discussions with the Corps, EPA, and the LMPT, the applicant moved the disposal of tailings outside of the Rock Creek floodplain. The storage of tailings outside of the Rock Creek floodplain reduces the chance that tailings would be mobilized off-site, decreases the permanent loss of waters of the U.S., increases reclamation opportunities, and provides the pit lake opportunity to establish overwintering fish habitat at mine closure. Placement of the tailings dam in the Rock Creek floodplain was rejected as not practicable by the Corps for the above reasons.

See Preliminary Plant Site Alternatives Analysis for additional information.

### **3.4 Other:**

The applicant considered different hauling methods from the Big Hurrah Mine and the Rock Creek Mine/Mill Complex (a distance of approximately 50 miles), including conveyer belts, railroads, aircraft, barges, trucks, and variations/combinations of the above. Availability of equipment, life of project, and distance were the limiting factors which led the applicant to choose their preferred alternative. The Corps determined that these options were too costly, would increase impacts to the environment, and/or were logistically not practicable.

### **3.5 Least Environmentally Damaging Practicable Alternative [40 CFR 230.10(a)]:**

Under the Section 404(b)(1) Guidelines it is the applicant's responsibility to demonstrate that there are no practicable alternatives that would be less damaging to the aquatic environment than the applicant's preferred alternative. As a result of discussions at approximately 59 pre-application meetings over a 3-year time period, with the LMPT and largely attended by the Corps, regarding project modifications and mitigation measures, the applicant proposed their preferred alternative. Pursuant to the analysis above in Sections 3.1, 3.2, 3.3, and 3.4, the Corps concludes that the discharge of fill material into waters of the U.S. for the construction of mining facilities, including the mill pad, mine, organic overburden stockpiles, development rock stockpiles, tailings storage facility, and roads at Rock Creek Mine/Mill Complex and Big Hurrah Mine, and the associated mitigation, would be the least environmentally damaging practicable alternative. This combined decision document will, therefore, assess the direct impacts of the applicant's proposed alternative in light of Federal statutes, regulations, and policies. The public interest review factors are discussed in detail following the Public Involvement Section of this document. Analysis of the consequences of the least environmentally damaging practicable alternative follows.

### **4.0 Mitigation [33 CFR 320.4(r); 40 CFR 230.70-77]**

The Rock Creek Mine Project was designed through an iterative process and discussions with the LMPT and the Corps to avoid wetlands where feasible and to minimize the overall footprint of the facility.

While the Corps believes the impacts of the proposed project would be minimal, we believe it is appropriate under the Section 404(b)(1) Guidelines and NEPA to require the applicant to mitigate impacts to waters of the U.S., including restoration of the creeks previously impacted by historical placer mining. In addition, the applicant proposed these mitigation measures as part of their permit application.

Upon reclamation, the pits at Rock Creek Mine/Mill Complex and at the Big Hurrah Mine would be allowed to fill with water to form lakes. Together they would total approximately 41 acres. At both sites the majority of the pits would be located in uplands and after they fill with water would become waters of the U.S. [33 CFR 328.3(a)(5)].

In addition, winter construction was proposed to mitigate the thawing of permafrost caused by the stripping of overburden that is likely to occur in the summer months.

#### **Rock Creek Mine/Mill Complex:**

Where the overall goal of avoiding wetlands could not be realized, attention was focused on minimizing disturbance to higher value willow habitat (discussed above in 2.1.1 Background) for avian species in consultation with the Corps, the U.S. Fish and Wildlife Service (USFWS) and the LMPT.

The applicant's final design incorporated the relocation of development rock stockpiles to uplands where practicable to minimize the area of wetland impacts. Furthermore, if uplands were not available, development rock stockpiles were located in lower value open tundra habitat to minimize impact to higher value willow habitat.

The beneficiation (gold extraction) process was designed to produce paste tailings in lieu of conventional tailings. The lower water content associated with paste tailings requires less storage area for tailings disposal, which in turn results in a smaller area of wetland impacts. The use of paste tailings reduces the amount of water in the TSF and reduces the potential for accidental discharge of contaminated material.

All road and foundation fill has been designed to utilize development rock and/or historical placer tailings so as not to cause additional disturbance by the creation of new quarries or material sites. The power line linking the facility to the Nome Joint Utilities would be placed within the existing road right-of-way so as not to create a new wetlands disturbance area. Workers would reside in town and commute to site thereby eliminating the disturbance that would be associated with creating a personnel camp. These measures reduce the project footprint in waters of the U.S.

A complete reclamation plan has been developed to ensure adequate reclamation of the disturbed areas. The applicant's reclamation plan is located in the Rock Creek Plan of Operations Volume 4 Reclamation Plan (Reclamation Plan). ADNR approved the applicant's reclamation plan on August 9, 2006; which includes the general stipulation that a total bond of \$6,844,700 must be posted prior to commencement of surface disturbing activities, or October 10, 2006, whichever is sooner. The bond shall not be released until all affected areas have been reclaimed (ADNR Rock Creek and Big Hurrah Mine Project Final Reclamation Plan and Approval). Organic material is planned to be stockpiled, to the extent feasible, for use in reclamation of the disturbed areas, which is approximately 62 acres. The 44 acres of the water management systems in wetlands would be reclaimed and restored to waters of the U.S. Development rock stockpiles and the TSF would be capped with organic soils from the overburden stockpiles, then contoured and seeded with native grasses. Part of the reclamation includes re-directing creeks through the pit lake after closure to create overwintering habitat for fish, re-grading, re-contouring, and re-application of topsoil to ensure a stable landform that is similar to original conditions. The pit lake area at Rock Creek that would be created would be 27 acres of waters of the U.S. The water quality of the pit lake would return to levels similar to or better than background conditions. The Reclamation Plan would ensure that much of the 341.5 acres of wetlands would be restored to landforms compatible with uses in the area.

#### Big Hurrah Mine:

The Big Hurrah Mine facilities have been located to avoid wetland impacts. The Big Hurrah facilities would not require the placement of any fill into waters of the U.S., except for the Big Hurrah Mine access road (5 acres).

Once ore extraction is completed at the satellite open mine pit it would be backfilled with development rock and used as a foundation pad for the ore stockpile to minimize impacts to surrounding uplands and waters of the U.S., specifically local creeks.

A complete reclamation plan has been developed and approved to ensure reclamation of disturbed areas, see reference above to the Reclamation Plan and Final Approval for Rock Creek and Big Hurrah under the Mitigation Rock Creek Mine/Mill Complex. Part of the reclamation includes re-directing Little Hurrah Creek through the main pit lake at Big Hurrah Mine after closure to create overwintering habitat for fish, re-grading, re-contouring, re-application of available topsoil, and re-planting of willows to ensure a stable landform that is an improvement over current conditions. The water quality of the pit lake would return to levels similar to or better than background conditions.

The Big Hurrah Mine access road has been aligned primarily within an existing right-of-way, which historically encroached on Big Hurrah Creek. To mitigate for this encroachment, the Big Hurrah Mine access road was designed in cooperation with the ADNR OHMP, not only to locate the road where it least impacted the stream, but also to incorporate fishery enhancement components requested by the state into the construction and reclamation plan.

During the construction of the Big Hurrah Mine access road the main channel of Big Hurrah Creek would be reclaimed and re-habilitated. Reclamation would include the removal and recontouring of previously unreclaimed historical placer tailings left in and adjacent to the creek to simulate more natural stream and riparian characteristics. The stream would be deepened to assist the stream in reclaiming a main channel in accordance with ADNR OHMP criteria. The use of historical placer tailings reduces impacts by eliminating new quarries or material sites. Additional placer tailings and fill material to construct the Big Hurrah Mine access road would come from pits strategically located within the floodplain. Pits within the stream would be designed and located to meet the criteria specified in the Title 41 Fish Habitat Permit issued by ADNR OHMP. The new stream design in Big Hurrah Creek would enhance overwintering fish habitat. This habitat type has been identified as important and lacking in the Solomon River watershed.

Additionally the historical placer tailings would be removed to bankfull height which simultaneously provides banks for stream establishment while allowing for additional flood capacity.

The rehabilitation of Big Hurrah Creek would include replanting or redistributing of willows salvaged from other disturbed areas to increase bank or slope stability. Establishment of riparian vegetation, including willows, would also provide habitat for birds and other wildlife, browse for moose, and shade for fish. The recontouring of the stream would increase sinuosity of the stream channel as well as create pools for fish. Portions of the area are expected to be re-established with wetlands over time.

The proposed mine reclamation plan would also re-establish Little Hurrah Creek from the mine pit to the connection with Big Hurrah Creek as waters of the U.S. It is anticipated that, upon completion of all mining and reclamation activities, portions of the drainages would be restored to more natural conditions than currently exist. The total area anticipated to be mitigated at Big Hurrah Mine is approximately 43 acres (29 acres of creek/habitat restoration and 14 acres of pit lake creation).

See Plan of Operations, Volume 4 Reclamation Plan.

<b>MITIGATION SUMMARY</b>		
<b>Mitigation Feature</b>	<b>Acres</b>	<b>Temporary Loss or New Gain of Waters of the U.S.</b>
<b>Rock Creek Mine/Mill Complex</b>		
Organic Overburden Stockpiles	62	Temporary Loss
Water Management Systems	44	Temporary Loss
Pit Lake	27	New Gain
<b>Big Hurrah Mine</b>		
Big Hurrah Creek	29	New Gain
Pit Lake	14	New Gain

## **5.0 Public Involvement**

The Corps received a complete application on May 29, 2006, and a 30-day Public Notice describing the project was issued and posted on our website on June 1, 2006. The Public Notice announced a Public Meeting to be held in Nome, Alaska on June 26, 2006. Electronic or hard copies of the Public Notice were sent to Federal, state, and local agencies, the Nome Eskimo Community, the City of Nome, the community of Solomon, adjacent property owners, the Postmaster in Nome, and members of the community who requested copies. The Public Notice comment period was extended an additional 20 days to July 20, 2006.

ADNR OPMP and the Corps ran concurrent reviews for their respective programs. The ADNR OPMP public notice gave contact information for the Corps Section 404 permit requirements, ADEC Waste Management Permit requirements, ADEC 401 Certificate requirements, and the Alaska Coastal Management Program Consistency Determination Requirements. The State's public notice also provided a link to the ADNR website, which included the following documentation: the Plan of Operations, e.g., the EID; State draft permits; and supporting documents. The ADNR OPMP public notice was posted in Nome, Alaska at the U.S. Post Office, the City of Nome, the Kegoayah Kozga Library and published in the Nome Nugget, Fairbanks Daily News-Miner, Anchorage, Daily News and on the ACMP website.

### **5.1 Comments received:**

#### **5.1.1 Federal Agencies**

U.S. Environmental Protection Agency (EPA): On June 28, 2006, EPA requested a 30-day extension to the Public Notice comment period. The Corps granted a 20-day extension. On July 20, 2006, EPA submitted a letter via e-mail stating they had several concerns and recommendations for the proposed work.

EPA suggested that a project of this magnitude should have had at least a pre-application meeting, and possibly a post-application meeting. EPA also expressed concern they did not have adequate time to review all the documents and information provided by the applicant. EPA opined there was insufficient

information to support approval of the project described in the Public Notice as they believed that the proposed project does not appear to be the least damaging practicable alternative. EPA stated there was not sufficient information in the Public Notice to determine whether the overall impacts to wetlands could be minimized, and the mitigation and closure information was incomplete and inadequate for the amount of wetlands that would be permanently destroyed.

EPA also recommended an alternatives analysis, complete with cost analyses, should include (but not be limited to): the disposal of Rock Creek development rock into Big Hurrah Creek's previously disturbed areas or upland areas (EPA noted the trucks would be going back empty, and suggested they could be filled with waste rock to minimize the footprint at Rock Creek); siting facilities completely out of wetlands (EPA stated there appear to be upland areas adjacent but there is not justification for not using them); and the storage of more development rock in the south stockpile. EPA was also concerned that the mine as proposed is not the full extent of the mining activity that may eventually occur in this area. They requested an assessment of the cumulative environmental consequences of past, present, and future actions to address all foreseeable impacts to the watershed. EPA expressed concern about damage caused by natural events, permafrost underlying the disposal facilities, sedimentation, and that the proposal to deposit acid-bearing tailings back into the pit upon closure would not provide fish habitat upon mine closure.

EPA requested the following conditions: "1. All disturbed and fill areas shall be stabilized to prevent erosion. Increased water turbidity and accumulation of sediment in drainages, sloughs, and other wetlands shall be evidence of insufficient stabilization. 2. No fill or construction materials shall be stockpiled on adjacent wetlands outside the project boundary. 3. Power lines should be designed to avoid impacts to birds in flight. The power line was not analyzed, but we are assuming there are no wetland impacts. 4. The Glacier Creek Road culvert at Lindblom Creek should be upgraded to accommodate the water from the diversion ditch around the mine, and provide for fish passage. 5. The applicant should work with the Alaska Department of Transportation on dust minimization, especially around subsistence areas and fish racks. 6. The applicant should work closely with the Department of Fish and Game to restore fisheries habitat to the fullest extent possible. Willows that will be disturbed for the stream restoration work should be saved and reused in the stream corridor. 7. 419 acres of wetlands will be permanently lost and only 42 acres mitigated. The 404 permit should include appropriate compensatory mitigation for unavoidable losses of these wetlands. In-lieu fees should be considered if insufficient compensatory mitigation opportunities exist. We'd be happy to work with all parties to identify appropriate mitigation."

EPA concluded there was insufficient information to warrant a finding of compliance with the 404(b)(1) Guidelines and it was premature to offer additional specific input. EPA suggested that when the Corps received adequate information to find a project in compliance with the Guidelines, that the Corps provide that information to EPA and they would provide additional comments or measures that can be taken to offset unavoidable adverse impacts. EPA also stated they believed that permitting a project of this size and potential impacts could be considered to constitute a major Federal action and suggested that an Environmental Impact Statement (EIS) might be the most appropriate tool to assess the impacts of the proposed project.

U.S. Fish and Wildlife Service (USFWS): The USFWS requested a time extension on June 28, 2006 to the Public Notice comment period. We granted a 20-day extension.

USFWS stated in a July 20, 2006, letter that they appreciated the applicant's efforts to avoid or minimize potential impacts to wetlands and other fish and wildlife habitat, and to mitigate project impacts by creating fish overwintering habitat and removing historical mine tailings from, and reclaiming, the Big Hurrah Creek floodplain.

USFWS noted that the project is within the migratory ranges of the spectacled eider (*Somateria fischeri*) and the Alaska-breeding population of Steller's eider (*Polysticta stelleri*), both of which are listed as threatened under the Endangered Species Act (Act). They went on to say that neither species has been recently documented as breeding in the Nome area, nor do the proposed project areas constitute potentially suitable breeding, molting or resting habitats. USFWS concluded the project is not likely to adversely affect these listed species; and therefore preparation of a Biological Assessment or further consultation under section 7 of the Act regarding this project is not necessary.

USFWS further mentioned that both Big and Little Hurrah Creeks likely support Arctic grayling. USFWS had concerns regarding bird mortality from collisions with power lines and recommended evaluation of burial of power lines within the Glacier Creek Bypass Road embankment, noting that burial may not be feasible and bird flight diverters might be suitable instead. USFWS also stated the proposed project will result in the permanent or long-term loss of 357 acres of wetlands due to road construction; pit excavation; development rock stockpiles; and, mill, tailings storage and water management facilities and in the temporary loss of 57.5 acres of wetlands due to organic overburden stockpiles. USFWS averred that due to the loss of a relatively large amount of wetlands and high-value breeding bird habitats that they believe additional mitigation may be appropriate to offset the anticipated impacts of the project to birds. They recommended that the applicant work with the Corps, the Service, the EPA and the ADNR-OHMP to identify additional mitigation opportunities in the project areas that will benefit birds. USFWS also opined that the applicant has proposed reasonable mitigation that, if effective, will offset potential project impacts to fish.

USFWS stated that they had no objection to permit issuance provided that the following conditions were added to the DA permit:

1. All organic materials from excavation, fill stockpile, and tailings storage areas shall be removed, segregated, and stockpiled for use during mine reclamation.
2. Any temporary or permanent standing water that will be created by project-related activities shall be tested and monitored on an on-going basis over at least a 10-year period (and longer, if needed) to determine whether toxicity/pollution levels exist that are harmful to fish, birds, or other wildlife. If so, such waters shall be (1) removed immediately (if temporary), (2) treated so that toxicity/pollution is reduced to a level that no longer poses a threat to wildlife, or (3) enclosed by deterrent devices (fencing, netting, weirs, etc.) that prevent wildlife and fish from coming into contact with toxic substances or polluted water.
3. Where the Glacier Creek Road crosses Lindblom Creek, the applicant shall install a culvert of sufficient size and design to accommodate the increased flows expected in Lindblom Creek as a result of diversion of Rock Creek-drainage surface waters above the mine site. The culvert should be designed to prevent downstream bed degradation from increased flows and it should allow for fish passage.
4. The applicant shall, to the extent practicable, maintain a 50-foot vegetated buffer between the active or rehabilitated Big Hurrah Creek channel and the Big Hurrah access road.
5. During Big Hurrah Creek tailings removal and channel/floodplain rehabilitation and recontouring, the applicant shall minimize destruction of riverine tall willow vegetation. Where necessary to remove this habitat, the applicant shall salvage willows and replant or redistribute them to increase bank or slope stability and to provide habitat for birds and shade structure and cover for fish, including in and around newly created pools.
6. To reduce the potential for bird collisions with the proposed power line (if line burial is not feasible), the applicant shall install and maintain bird diverter devices within ¼-mile on either side of the new Glacier Creek Bridge. Diverters shall be spaced not more than 65-feet and alternate between outside wires. Power line poles and transmission lines also shall be designed to meet Avian Power Line Interaction Committee standards for reducing the likelihood of bird electrocution (<http://www.aplic.org/>).
7. The applicant shall work with the Corps, the Service, the EPA, and the ADNR OHMP to identify additional mitigation opportunities in the project areas that will benefit birds. If on-site mitigation opportunities are limited, the applicant and the agencies shall meet to discuss the potential for, and appropriate levels of, compensatory mitigation, such as in-lieu fees.
8. All disturbed and fill areas shall be stabilized to prevent erosion. Increased water turbidity and accumulation of sediment in drainages, sloughs, and other wetlands shall be evidence of insufficient stabilization.
9. No fill or construction materials shall be stockpiled on adjacent wetlands outside the project boundary.
10. Natural drainage patterns shall be maintained to the extent practicable by the installation of culverts in sufficient in number and size, or the repair of existing culverts, to prevent ponding, diversion, or concentrated runoff that would result in adverse impacts to adjacent wetlands and other fish and wildlife habitats.

National Marine Fisheries Service: In a June 12, 2006, memo NMFS stated they had no objection to the project.

U.S. Coast Guard did not comment.

### 5.1.2 State Agencies

ADNR OHMP issued a Fish Habitat Permit for work in Big Hurrah Creek and Linda Vista Creek on August 9, 2006.

ADEC issued the Certificate of Reasonable Assurance pursuant to Section 401 of the Clean Water Act on August 9, 2006 with 16 conditions, see Section 7.0 below.

ADNR OPMP: In a July 31, 2006, letter ADNR OPMP issued the Consistency Determination under the Alaska Coastal Management Program. Two conditions related to historic properties were included in their determination: 1. The State Office of History and Archeology must receive a copy of the Big Hurrah archeological report with findings from the US Army Corps of Engineers, and 2. If the Rock Creek Project cannot avoid NOM-129 (cabin, collapsed bunk house, sled) the applicant must determine if the impacts would cause an adverse impact to the site. These findings must be received and commented on by the State Office of History and Archeology.

ADNR, Office of History and Archaeology: In a July 27, 2006, letter the State Historic Preservation Officer (SHPO) concurred with the Corps finding that site NOM-129 is eligible for inclusion in the National Register of Historic Places (NRHP) under Criterion D, that the Big Hurrah Mine is eligible for the NRHP as a historic district (SOL-136) under Criteria A, C, and D, and that 14 other sites are not eligible for inclusion in the NRHP.

### 5.1.3 Federally Recognized Tribes

The public notice was sent to the following Federally Recognized Tribe, the Nome Eskimo Community. No protected resources were identified by the local federally recognized tribe. The Nome Eskimo Community stated in an August 16, 2006, letter, received after the public notice comment period ended, that they wanted an Environmental Impact Statement.

On January 16 and 17, 2007, the Corps sent letters to the Nome Eskimo Community and Native Village of Solomon regarding Section 106 consultation and government to government consultation, respectively. The Corps informed them that if they believed the Rock Creek Mine Project may significantly affect tribal rights and/or protected resources to contact the Corps. The Nome Eskimo Community responded in a letter dated January 31, 2007 requesting Tribal Consultation. On February 1, 2007, the Corps requested in writing that the Nome Eskimo Community identify which protected tribal right or resource(s) would be affected. On February 2, 2007, the Nome Eskimo Community sent a letter rescinding their request for further Tribal Consultation based on their review of several documents including the "Cultural Resources Survey of Proposed Mining Development Activities in the Rock Creek Area" that was prepared by Northern Land Use Research, Inc. The Nome Eskimo Community stated that they "feel this review was adequate and that the area possesses a very low probability of revealing additional sites." The Native Village of Solomon did not respond within the timeframe requested (7 days), therefore, the Corps emailed the President of the Tribal Council in Solomon and provided electronic copies of the letters. The Native Village of Solomon did not respond.

### 5.1.4 Local Agencies

The City of Nome stated in an August 15, 2006, letter, received after the public notice comment period ended, that they wanted an Environmental Impact Study to address issues of cyanide associated with the project.

### 5.1.5 Organizations

Letters addressed to the Corps are noted below, letters addressed to ADNR or other agencies are not listed below.

- The following organizations submitted letters supporting the project because it would provide economic benefits and local hiring in the Nome region:
  - Nome Chamber of Commerce (June 29, 2006)
  - Resource Development Council (July 6, 2006)
  - Alaska Miners Association, Incorporated (July 6, 2006)
- The Center for Science and Public Participation (June 23, 2006) had concerns about the reclamation plan for the project. They recommended that the organic overburden stripped from where the rock stockpile locations should be used as cap material upon reclamation of the stock piles.

- In a June 30, 2006, e-mail Trustees for Alaska (Trustees) on behalf of the Northern Alaska Environmental Center, the Alaska Center for the Environment, Austin Ahmasuk, organizations, and a Nome resident; stated they had several concerns regarding impacts on human health and environment posed by the project. They expressed concern about the Corps NEPA process, particularly, the fact that no drafts of the Environmental Assessment (EA), Finding of No Significant Impact (FONSI), or permit would be released for public comment. They also stated no permit should be granted in this situation.

Trustees noted the Alaska Gold Company promulgated an environmental information document (EID), which included less than one page of discussion about wetlands. They stated that according to that document, the Rock Creek Mine/Mill Complex site contains 681 acres of wetlands, which is over half of the 1,298-acre project area. They noted that of the 681 acres of wetlands on the project site, 401 acres will be 'disturbed' by the project; and 58% of the wetlands on site will be 'disturbed,' or 31% of the project area. They opined the environmental informational document does not define what 'disturbed' means, but presumably it means the destruction or significant alteration of the wetlands. Trustees stated the proposed 'disturbance' of 401 acres of wetlands is a significant environmental effect, which requires preparation of an EIS.

Trustees went on to say the Snake River watershed is a biologically productive watershed with many creeks that are served by the wetlands, which in their opinion provide for food chain production, general habitat and nesting, spawning, rearing and resting sites for aquatic or land species. Trustees stated the disturbance of these wetlands would likely detrimentally affect natural drainage characteristics, sedimentation patterns, salinity distribution, flushing characteristics, or other environmental characteristics. They expressed their belief that the damage to these wetlands resources far outweighs any benefits of a four-to-five-year mining project that, while it may provide an economic benefit to the applicant, will significantly and detrimentally affect water quality and subsistence resources for the local population.

They concluded the environmental information document provided no basis upon which to issue the proposed 404 permit. Furthermore, they also stated that the water quality certification is not warranted in this case because of the EPA's anti-degradation regulation.

### 5.1.6 Companies

We received 22 form letters on July 6, 2006, from various companies supporting the project. In addition, the following companies submitted letters supporting the project:

- Solomon Native Corporation (July 6, 2006)
- Inuit Services Incorporated (March 15, 2006)
- Wales Native Corporation (June 14, 2006)
- Brevig Mission Native Corporation (June 20, 2006)
- Bering Straits Native Corporation (June 22, 2006)
- Sivuqaq Incorporated (June 29, 2006)
- Paul and Company (July 5, 2006)
- Chiulista Camp Services, Incorporated (July 5, 2006)
- Craig Taylor Equipment Company (July 5, 2006)
- Online Exploration Services, Incorporated (July 6, 2006)
- A.M. King Industries, Incorporated (July 6, 2006)
- Norton Sound Economic Corporation (August 11, 2006)

### 5.1.7 Individuals

We received 52 letters from individuals during the public notice comment period, 45 were in support of the project and 7 were opposed to the project. See Table 1: Comment Letter Topics and Responses. NOTE: Comments sent directly to ADNR were forwarded to the Corps and are also considered in this evaluation.

## 5.2 Evaluation and Consideration of Comments:

### 5.2.1 Response to EPA Comments

*In regard to EPA's concern about pre-application meetings:* EPA was involved in several pre-application meetings with the Corps and LMPT. EPA Alaska Operations Office personnel were engaged in pre-application discussions regarding the proposed tailings disposal method, alternative locations, designs, groundwater, surface water, and geochemistry, to ensure that there were no waste streams from the site requiring a Section 402 permit. In addition, EPA Region 10 specialists visited the Rock Creek Mine/Mill Complex to evaluate the proposed injection well system.

*In regard to EPA's concern about the Corps Public Notice:* As discussed in Section 5.0, the Corps public notice was available for review on the Corps website on June 1, 2006 and the ADNR OPMP public notice ran concurrently, with links to pertinent documents such as the EID. The public notice comment period was extended at the request of EPA and USFWS for an additional 20 days. The Corps determined that adequate information was submitted as prescribed at 33 CFR 325.1(d)(1) for a complete application, and to issue a public notice and get meaningful public response. As noted at 33 CFR 325.1(d)(9), the issuance of a public notice will not be delayed to obtain information necessary to evaluate the application. The Corps public notice included a description of wetland impacts and acreages for each component of the mine and mill, as well as proposed mitigation measures. The closure method and reclamation plans were fully described in the State applications which the Corps independently evaluated and determined sufficient.

*In regard to EPA's concern about an Alternatives Analysis:* Alternatives, including those suggested by EPA (see Section 3.0 above), were described and thoroughly discussed through multiple meetings with the Corps and LMPT. The Corps determined that the cost analysis was adequate. After review of the Rock Creek Plan of Operations and supporting documentation, the Corps determined that the applicant had supplied adequate information to complete an analysis of practicable alternatives. Based on its own independent analysis the Corps has determined that the applicant's preferred alternative is the least environmentally damaging practicable alternative.

*In regard to EPA's concern about Cumulative Impacts:* Future development is not required to be addressed in the Corps public notice, but the cumulative environmental consequences of past, present, and future actions will be addressed in this combined decision document. The Corps does not currently have an application from the applicant or anyone else for mine development in the Nome region, although the applicant and other entities continue to conduct exploratory operations in the Nome region.

*In regard to EPA's general concerns about natural events:* The issues of permafrost, sedimentation, and revegetation were addressed by thermal modeling, a seismic hazard analysis (EID, 7.3.3.1 Seismic Hazard, pp. 52 - 53), overburden balance, and multiple discussions with the Corps and the LMPT. In addition, winter construction was proposed to mitigate the thawing of permafrost caused by the stripping of overburden that is likely to occur in the summer months.

*In regard to EPA's concern about acid-bearing tailings:* EPA was concerned about placing acid-bearing tailings back into the pit upon closure and its suitability as fish habitat. However, there would not be any acid-bearing tailings placed in any of the pits. The potentially acid generating development rock would be isolated from oxygen by being buried, capped with non-acid generating development rock, and then fully submersed under water. Consequently, there would not be the potential for acid generation due to the anaerobic environment (EID, 7.3.2.2 Consequences, pp. 46 - 52).

*In regard to EPA's recommended conditions:* EPA requested inclusion of 7 conditions in the DA permit. After review and discussion in this document, the Corps determined that the requested conditions were merited; therefore, all EPA recommended conditions would be adopted as special conditions, if the permit is issued (minor changes in wording were coordinated with EPA); see Section 6.3 Special Conditions and Rationale for Inclusion. Additionally, compensatory mitigation and in-lieu fees will be considered during this environmental review; however, avoidance and minimization has been implemented as discussed above in Sections 3.2 Other Designs, 3.3 Other Sites, 3.4 Other, and 4.0 Mitigation. As stated in the public notice, a mitigation plan was proposed by the applicant and is being evaluated by the Corps.

*In regard to EPA's opinion that an EIS might be the best tool to assess a project of this magnitude:* The size of a project does not dictate the need for an EIS; a significant impact on the quality of the human environment must be identified to require an EIS. A major Federal action is any action that requires Federal authorization, funding, land management, or has some other Federal nexus. NEPA allows the lead Federal agency, the Corps, to determine through our established EA procedures whether an EIS will be required. The Corps will consider the nature and magnitude of all impacts; including, permanent, temporary, and reasonably foreseeable impacts; as well as measures to minimize or mitigate these impacts to determine whether an EIS is required.

#### **5.2.2 Response to USFWS Comments**

In response to the USFWS recommended conditions and our discussion of impacts within this review, it was determined that all of the recommended conditions would help to avoid and minimize impacts to resources of concern. Therefore, all USFWS recommended conditions would be carried as special conditions (minor changes in wording were coordinated with the USFWS), if the permit is issued; see Section 6.3 Special Conditions and Rationale for Inclusion.

#### **5.2.3 Response to NMFS Comments**

No response required.

#### **5.2.4 Response to ADNR OHMP, ADEC, and ADNR OPMP**

All concerns and issues were evaluated and considered in the LMPT meetings and no additional comments were received on the Corps public notice.

#### **5.2.5 Response to ADNR, Office of History and Archaeology**

Consultation with SHPO pursuant to the National Historic Preservation Act resulted in a special condition which requires a Memorandum of Agreement prior to mining, which would be carried on the DA permit, if the permit is issued.

#### **5.2.6 Response to Federally Recognized Tribes**

This EA will determine whether an EIS is required. In the August 16, 2006 letter from the Nome Eskimo Community formal government-to-government consultation was not requested. Additional coordination with the Nome Eskimo Community and the Native Village of Solomon (letters dated January 16 and 17, 2007) resulted in no requests for additional Section 106 coordination or formal government-to-government consultation. A draft of the MOA with SHPO addressing the known historic sites required by proposed special condition, which would be carried on the DA permit, will be sent to both of these Federally Recognized Tribes for informational purposes.

#### **5.2.7 Response to Local Agencies**

The City of Nome requested the Corps write an Environmental Impact Study. A thorough study of possible impacts of the project was written by the applicant and has been independently reviewed and evaluated by the Corps and the LMPT. This EA will determine if an EIS or Finding of No Significant Impact is appropriate.

#### **5.2.8 Response to Organizations**

- *In response to the organizations in support of the project:* The Corps agrees that the project could result in economic benefits and could result in local hiring in the Nome region.
- *In response to the Center for Science and Public Participation:* The Corps agrees that the organic overburden stripped from the development rock stockpile locations should be used as cap material during reclamation to promote revegetation. This recommendation would be carried as a special condition on the DA permit, if issued.

- *In response to the concerns of Trustees for Alaska:*
  - *In regard to the Corps NEPA process:* The Corps will consider all comments received in response to the Public Notice in this document. In addition, the information considered by the Corps was all made publicly available and the public submitted comments on that information.
  - *In regard to the lack of discussion about wetlands in the EID:* The applicant submitted preliminary wetland delineations, including extensive wetland mapping of Rock Creek and Big Hurrah, for review by the Corps prior to the EID. The Corps reviewed and approved the delineations. The Corps Public Notice included a drawing depicting the amount of wetlands that would be impacted by the project and provided a summary of wetland impacts. In addition, this document contains our analysis of wetland impacts as well as our review and compliance determination of the 404(b)(1) Guidelines.
  - *In regard to the disturbance of wetlands and need for an EIS:* The disturbance of wetlands (as described in the Public Notice) and the number of acres does not dictate the need for an EIS; a significant impact on the quality of the human environment must be identified to require an EIS. The footprint within the watersheds has historically been disturbed by placer and hard rock mining. Furthermore, the 681 acres of habitat (combined uplands and wetlands) to be disturbed for the Rock Creek Mine/Mill Complex represents only 1.25% of the total 54,400 acres (85 square miles) of similar habitat in the Snake River watershed (EID, Section 7.5 Hydrology and Water Quality, p. 56). NEPA allows the Corps to determine through its established EA procedures whether an EIS will be required. The Corps will consider the nature and magnitude of all impacts; including, permanent, temporary, and reasonably foreseeable impacts; as well as measures to minimize or mitigate these impacts to determine whether an EIS is required. The applicant's proposed project design minimizes impacts to high value avian and moose habitat. In light of overall proposed mitigation measures, the applicant has further reduced impacts to waters of the U.S. The Corps has determined that the applicant's preferred alternative is the least environmentally damaging practicable alternative (Section 3.5).
  - *In regard to the Water Quality Certification and EPA's anti-degradation regulation:* EPA deals with the anti-degradation regulations and has oversight of the 401 program; EPA did not comment on these issues. Therefore, issuance of the 401 Certificate by ADEC is deemed conclusive with respect to water quality considerations in accordance with 33 CFR 320.4(d).

### 5.2.9 Response to Companies

The Corps agrees that the project could result in economic benefits and could result in local hiring in the Nome region.

### 5.2.10 Response to Individuals

52 individuals commented during the public notice comment period, 45 of which were in support of the project and 7 of which were opposed to the project. See Table 1: Comment Letter Topics and Responses.

Table 1: Comment Letter Topics and Responses

List of Comment Letter Topics	Location of Response to Comment in this Document or Applicability
Water	6.1.4 Water, water quality
Water contamination/pollution/quality	6.1.17 Contaminant determinations
Groundwater	6.1.9 Wetlands as groundwater recharge areas
Surface Water - data collection	6.1.2 Water circulation, fluctuation, salinity determinations, current patterns and water circulation, and salinity gradients

Snake River is drinking water source	6.1.8 Water supply and conservation
Stream re-classification	State issue, under consideration by ADEC
Impact to private wells	6.1.8 Water supply and conservation, municipal and private water supplies
Rock Creek pit lake water quality	6.1.4 Water, water quality
Big Hurrah pit lake water quality/fish	6.1.4 Water, water quality
Injection wells	EPA permit pending
Vegetation contamination, wetlands	6.1.12 Special aquatic sites, wetlands
Habitat destruction	6.1.14 Essential fish habitat, 6.1.15 Wildlife, fish and wildlife values
Subsistence	6.1.20 Subsistence
Visual disturbances	6.1.22 Aesthetics
Recreational disturbances	6.1.19 Recreational fisheries, 6.1.21 Water-related recreation, recreation
Noise pollution	6.1.39 Secondary impacts
Air pollution	State issue, Clean Air Act Conformity
Dust	5.2.1 Response to EPA Comments, 6.1.39 Secondary impacts, Special conditions
Traffic	6.1.39 Secondary impacts
Local hiring	6.1.32 Economics, Employment
Foreign ownership of the company	Beyond the purview of the Corps
Reclamation plan	4.0 Mitigation, ADNR Reclamation Plan, Volume 4 Reclamation Plan, Special conditions
Economics	6.1.32 Economics
Jobs	6.1.32 Economics, Employment
Economic stimulation	6.1.32 Economics
Taxes	6.1.32 Economics, Tax revenue
Benefit to health and welfare of community	6.1.32 Economics, Community Services
Bioaccumulation in reindeer	6.1.20 Subsistence
Significant environmental effect on 400+ acres of wetlands	5.2.1 Response to EPA Comments, 5.2.8 Response to Trustees for Alaska, 6.1.12 Special aquatic sites, wetlands
Toxic chemicals (GENERAL) and heavy metals	6.1.17 Contaminant determinations, 6.1.39 Secondary impacts
Cyanide (GENERAL)	6.1.39 Secondary impacts
Cyanide - use of, altogether	ADEC Waste Management Permit
Cyanide - banned other places, why not here?	Allowed under State of Alaska Law
Cyanide - leaching/leachate	State issue, 6.1.39 Secondary impacts
Cyanide - handling/transport/spills	State issue, 6.1.39 Secondary impacts
Cyanide - different chemical forms	State issue, 6.1.39 Secondary impacts
Cyanide – on-site long-term effects	State issue, 6.1.39 Secondary impacts
Cyanide - air quality	ADEC Air Quality Permit
Cyanide - in paste tailings	State issue, 6.1.39 Secondary impacts
Toxic tailings - long term presence	State issue, 6.1.39 Secondary impacts
Acid mine drainage	State issue, 6.1.39 Secondary impacts
Waste management	ADEC Waste Management Permit, Special conditions

Leaching/Leaking chemicals	State issue, 6.1.17 Contaminant determinations, 6.1.37 General environmental benefits, 6.1.39 Secondary impacts
Old dredges	ADNR Reclamation Plan, Volume 4 Reclamation Plan, SHPO
Consequences of an open pit mine	6.1.2 Water circulation, fluctuation, salinity determinations, current patterns and water circulation, and salinity gradients, 6.1.17 Contaminant determinations, 6.1.37 General environmental benefits, 6.1.39 Secondary Impacts
Alternatives Analysis	3.0 Alternatives Considered, 5.2.1 Response to EPA Comments
Public review - involvement, need to, time to review	5.2.1 Response to EPA Comments
Opportunity to review the EA	5.2.1 Response to EPA Comments
Failure to follow Corps regulations, violate CWA, destruction of wetlands	5.2.1 Response to EPA Comments, 5.2.8 Response to Trustees for Alaska
EIS - NEPA	5.2.1 Response to EPA Comments, 5.2.8 Response to Trustees for Alaska
Monitoring and Testing	6.1.17 Contaminant determinations, Special conditions
Inspections/Inspectors – Will the Corps inspect as well?	State issue, MSHA issue. Yes, Corps compliance inspections will address this concern.
Who pays for clean up - bonding	4.0 Mitigation, ADNR Reclamation Plan, Volume 4 Reclamation Plan
Want study on geology and impacts	EID pp. 44-186, Appendix Geology-Geochemistry
Extend comment period	5.2.1 Response to EPA Comments, 5.2.2 Response to USFWS Comments
Good company	Beyond the purview of the Corps
LMPT not qualified to make decision	The LMPT consisted of subject matter experts and they hired consultants when necessary.
State's lack of experience with mining	Beyond the purview of the Corps
ADEC did not follow the regulations	Beyond the purview of the Corps

**6.0 Analysis of Beneficial and Detrimental Impacts to the Environment and the Public Interest, and Factual Determinations for Discharges of Dredged or Fill Material** [33 CFR 320.4(a-r), 33 CFR 325 App B, and 40 CFR 230.11 and 230.20 - 230.77]

**6.1 Factors** (NOTE: The number of the special condition as it would appear in the DA permit is shown followed by the text of the special condition and the rationale for inclusion of the special condition. The rationale is in italics)

**6.1.1 Physical substrate determinations 230.11(a) and Substrate 230.20:**

Rock Creek Mine/Mill Complex

The wetland substrate or soil consists of Histic Pergelic Cryaquepts with a loamy or gravelly texture. These soils are poorly drained with a shallow permafrost table. The soils formed in the moderately deep loamy sediment are underlain by gravelly and stony material. The wetland substrate would be removed from under the waste dumps, tailings storage facility, building pads and internal mine roads, and then transported to organic storage stockpiles. The stacking of the soil would eliminate any identifiable soil horizons by the overturning and placement in the new temporary storage location. This impact would be mitigated with the inclusion of special conditions, if the permit is issued, to facilitate reclamation and to ensure that there are no impacts to wetlands outside the authorized footprint: 1. All organic materials from excavation, fill pads and roads, development rock stockpiles, and tailings storage areas shall be removed, segregated and stockpiled for use during mine reclamation. *This condition is required to facilitate reclamation of the tailing storage facility, development rock stockpiles, haul roads, water*

*management systems, mill pad, stream corridors, and riparian areas as stated in the Reclamation Plan approved by ADNR. Spreading the organic material at the surface during reclamation promotes revegetation.* 8. All fill and disturbed areas shall be stabilized to prevent erosion. Increased water turbidity and accumulation of sediment in drainages and adjacent wetlands shall be evidence of insufficient stabilization. *This condition is required to prevent sedimentation outside the permitted area [40 CFR PART 230.21 and 230.72].* 9. Project limits of authorized sites shall be clearly identified in the field (e.g., staking, flagging, silt fencing, existing footprint for maintenance activities, etc.) prior to additional clearing and construction to ensure avoidance of impacts to waters of the U.S. (including wetlands) beyond project footprints. No fill or construction materials shall be placed outside the project boundary. *This condition is required to prevent the placement of fill or anything that may have the effect of fill outside the permitted area; thereby, minimizing the area of substrate impacts [40 CFR PART 230.70].* Also, see Section 6.3, ADEC condition 15.

The substrate in the uplands consists of rock outcrops and a thin veneer of degraded metamorphosed parent material, comprised mainly of mixed schist rock. This substrate consists of little to no organic layer. Rock outcrops and schist rocks are excessively drained due to steep slopes, porosity, and the lack of fines in the parent material to retain water. The upland substrate would be buried under the development rock stockpiles, TSF, and permanent fills for roads and pads.

#### Big Hurrah Mine

The wetland substrate or soil consists of Histic Pergelic Cryaquepts with a loamy or gravelly texture. These soils are poorly drained with a shallow permafrost table. The soils formed in the moderately deep loamy sediment are underlain by gravelly and stony material. For construction of the Big Hurrah Mine access road, fill would be placed onto 5 acres of wetland substrate. This impact would be mitigated with the inclusion of special conditions, if the permit is issued, to ensure that there are no impacts to wetlands outside the authorized footprint: 8. All fill and disturbed areas shall be stabilized to prevent erosion. Increased water turbidity and accumulation of sediment in drainages and adjacent wetlands shall be evidence of insufficient stabilization. *This condition is required to prevent sedimentation outside the permitted area [40 CFR PART 230.21 and 230.72].* 9. Project limits of authorized sites shall be clearly identified in the field (e.g., staking, flagging, silt fencing, existing footprint for maintenance activities, etc.) prior to additional clearing and construction to ensure avoidance of impacts to waters of the U.S. (including wetlands) beyond project footprints. No fill or construction materials shall be placed outside the project boundary. *This condition is required to prevent the placement of fill or anything that may have the effect of fill outside the permitted area; thereby, minimizing the area of substrate impacts [40 CFR PART 230.70].* Also, see Section 6.3, ADEC condition 15.

See EID, Section 7.4 Soils, p. 54-56 for additional information.

#### **6.1.2 Water circulation, fluctuation and salinity determinations 230.11(b), Current patterns and water circulation 230.23, and Salinity gradients 230.25:**

##### Rock Creek Mine/Mill Complex

Surface water and precipitation runoff from undisturbed areas upslope of the Rock Creek facility development rock stockpiles and open pit would be diverted around the project area in a northerly flowing channel that empties into Lindblom Creek. Precipitation runoff from the South Development Rock Stockpile would filter through the vegetative mat into the surrounding area and/or be routed along a channel and re-introduced back into the Lower Rock Creek. A similar channel system would direct precipitation runoff from the North Development Rock Stockpile into Lindblom Creek. Groundwater moving towards the pit, would be intercepted with perimeter pumping wells, and would be pumped to the mill. Excess water during high flows would be treated and reintroduced to the groundwater through a Class V injection system. Surface water from the plant site area, along with water pumped from the open pit, seepage collected from the toe of the tailings dam, and rainfall and snow melt within the Tailings Storage Facility (TSF) would be collected and directed to collection sumps, which would be pumped to the Mill Recycle Water Pond for recycle back to the process plant.

The water management system described above would result in the following direct effects during mine/mill operations (estimated 4-5 years of operation): Lindblom Creek flows would increase; Rock

Creek flows would decrease; with the exception of the groundwater injection well locations, areas down-gradient of the diversion channels would no longer contribute appreciable ground or surface water for the life of the mine; runoff rates would increase, resulting in larger baseflows during rains and lower baseflows during dry periods, and aquifer recharge would temporarily decrease. The direct effects following mine closure and reclamation include attenuation of Rock Creek flows via the pit lake, reduced infiltration at the TSF and increased infiltration at rock dumps.

Effects on water circulation and/or fluctuation patterns would be localized to the immediate reaches at the mine site; therefore, no more than minimal impacts would occur within the Snake River watershed. With the incorporation of activities specified in the Water Management Reports, these effects would be no more than minimal.

### Big Hurrah Mine

Groundwater would be intercepted before entering the pit, treated if necessary, and reinjected in a Class V underground injection system. Pit sumps would collect runoff and groundwater not intercepted by the previous interception system, treated, and reinjected. Little Hurrah Creek would remain in its natural channel for as long as possible, before being routed along a constructed mine bench. Diversion ditches would be constructed around the pit perimeter and discharged to Little Hurrah Creek. Also, diversion ditches would be constructed around the perimeter of the Development Rock dump and Ore Stockpile to discharge water not in contact with mining activities into the local surface water. Runoff from the ore stockpile would be combined with pit water.

As a direct effect, the water management system at Big Hurrah Mine would result in overall attenuation of stream flows once the pit has filled following site closure (estimated time to fill is two spring freshets).

Effects on water circulation and/or fluctuation patterns would be localized to the immediate reaches at the mine site; therefore, no more than minimal impacts would occur within the Solomon River watershed. With the incorporation of activities specified in the Water Management Reports, these effects would be no more than minimal.

See EID, Section 7.5 Hydrology and Water Quality, pp. 56-186; Volume 5 Water Management Reports; and, EID Appendix, Water Management Reports for additional information.

### **6.1.3 Suspended particulate/turbidity determinations 230.11(c) and 230.21:**

#### Rock Creek Mine Project

The placement of fill for roads and pads may cause a small, temporary amount of suspended particulates within the jurisdictional wetlands adjacent to the fill at both sites. The suspended particulates may cause a short-term increase in turbidity, which would not be long enough to impact aquatic organisms that depend on light to photosynthesize. In some areas, surface runoff would flow through a riparian buffer before reaching the local creeks, which should minimize sedimentation from development rock stockpiles. At the Rock Creek Mine/Mill Complex and the Big Hurrah Mine, multiple systems of diversion channels and settling ponds would be constructed to collect and transport surface water and sediment. A short term increase in suspended particulates and turbidity is anticipated during placer tailings removal, stream channelization, and reclamation work in Big Hurrah Creek. With implementation of the EPA Stormwater Pollution Prevention Plan, the suspended particulate impacts would be minimized. The ADEC 401 Certificate includes several conditions to minimize suspended particulates and turbidity (see Section 6.3, ADEC conditions 1, 3, 4, 6, 7, 8, 9, 10, 11, 13, 14, and 15).

For more information and collected data, see EID, Section 5.4 Water Management, pp. 31-32, Section 7.5 Hydrology and Water Quality, pp. 56-186; EID Appendix Geology-Geochemistry/Geochemistry and Groundwater; Volume 4 Reclamation Plan, Section 5.4.4 Reclamation of Settling Ponds and Diversion Ditches, pp. 28-29.

**6.1.4 Water 230.22 (nutrients, chemical content, dissolved gas, pH, temperature), water quality 320.4(a), and 320.4(d):**

Rock Creek Mine Project

Nutrient transport would be reduced for the life of the mine project, and beyond, until the reclamation activities have been completed, and the sites once again support nutrient-producing vegetation. Water temperatures would increase somewhat beyond existing levels at the well injection sites, as well as within the pits after closure since the water would be retained in the pits longer than current flows within those existing reaches of Rock Creek and Big Hurrah Creek. Existing background water quality is below State Water Quality Standards for some parameters at Rock Creek. Water quality in Little Hurrah Creek meets the State Water Quality Standards for all parameters. Water quality standards at both pit lakes would also be met after reclamation. At the Rock Creek pit lake, water quality would actually improve over background levels as a result of dilution of groundwater with surface water from Rock Creek upon reclamation. Based upon geochemical analyses, runoff from development rock at both sites is anticipated to be benign. See also discussion above “Suspended particulate/turbidity determinations”.

No more than minimal impacts to water and water quality would occur as a result of the proposed project, with the inclusion of ADEC and SWPPP conditions. ADEC has issued a 401 Water Quality Certificate of Reasonable Assurance with applicable effluent limitations and water quality standards required under provisions of Section 401 of the Clean Water Act. This is considered conclusive with respect to water quality considerations [33 CFR 320.4(d)]. This impact would be mitigated with the inclusion of special conditions, if the permit is issued, to ensure that impacts to water quality are no more than minimal: 2. Any temporary or permanent standing water that will be created by project-related activities shall be tested and monitored on an ongoing basis over at least a ten year period (and longer, if needed) to determine whether toxicity/pollution levels exist that are harmful to fish, birds or other wildlife. If so, such waters shall be (1) removed immediately (if temporary), (2) treated so that toxicity/pollution is reduced to a level that no longer poses a threat to wildlife, or (3) enclosed by deterrent devices (fencing, netting, weirs, etc.) that prevent wildlife and fish from coming into contact with toxic substances or polluted water. *This condition is required to ensure that pollutants do not enter any surface water that may be utilized by fish and wildlife [40 CFR PART 230.22].* 4. A 50 foot vegetated buffer shall be maintained, to the extent practicable, between the active or rehabilitated Big Hurrah Creek channel and the Big Hurrah access road. *This condition is required to maintain the integrity and functions of the riparian buffer adjacent to Big Hurrah Creek [40 CFR PART 230.21]. Riparian buffers filter surface runoff which can be a source of pollutants.* 8. All fill and disturbed areas shall be stabilized to prevent erosion. Increased water turbidity and accumulation of sediment in drainages and adjacent wetlands shall be evidence of insufficient stabilization. *This condition is required to prevent sedimentation outside the permitted area [40 CFR PART 230.21 and 230.72].*

See EID, Section 5.4 Water Management, pp. 31-32, Section 7.5 Hydrology and Water Quality, pp. 56-186; EID Appendix, Hydrology; EID Appendix Geology-Geochemistry; Volume 8 Geochemistry and Groundwater; and, ADEC 401 Certificate for additional information.

**6.1.5 Flood hazards 320.4(a)(1), floodplain values 320.4(a)(1), Normal water fluctuations 230.24, wetlands as storage for storm and flood waters 320.4(b)(2)(v):**

Rock Creek Mine Project

Some floodwater storage capacity would be lost as a result of the work in wetlands. As the project is minor in size compared to the surrounding area, this impact would be considered to be no more than minimal.

**6.1.6 Floodplain management (functions, degradation of floodplain values and functions Executive Order (EO) 11988, practicable alternatives) 320.4(l):**

Rock Creek Mine Project

EO 11988 is not applicable. This project is not in an area mapped as a floodplain by the Federal Emergency Management Agency. Some flood attenuation would be decreased as a result of the loss of

wetlands adjacent to streams. Due to the vast amount of similar habitat, effects on floodplain values and functions would be considered to be no more than minimal.

#### Big Hurrah Mine

The floodplain capacity of Big Hurrah Creek would be increased by the removal of placer tailings for the reclamation of the new stream.

#### **6.1.7 Wetlands shielding other areas from wave action, erosion, or storm damage 320.4(b)(2)(iv):**

The wetlands in the Rock Creek Mine Project area do not provide this function.

#### **6.1.8 Shore erosion and accretion 320.4(a)(1):** Not applicable (N/A).

#### **6.1.9 Wetlands as groundwater recharge areas 320.4(b)(2)(vi):**

##### Rock Creek Mine/Mill Complex

Wetlands within the Rock Creek Mine/Mill Complex essentially serve as holding places for water, slowly releasing water and aiding in the maintenance of baseflows for Rock, Lindblom, and Glacier Creeks, which are part of the Snake River watershed. More than 300 acres of wetlands would be eliminated from this watershed as a result of the proposed project. The result would be faster runoff of precipitation from the disturbed landscape, less infiltration to groundwater and lower baseflows within the immediate project area. These effects would, however, be localized around the mine sites and would not be expected to have more than minimal impacts to the Snake River watershed. Additionally, these effects would diminish over time upon site closure and as recovery progresses after reclamation.

##### Big Hurrah Mine

At the Big Hurrah Mine, any impacts to recharge would be negligible due to the small amount of wetland impact. The 5 acres of fill to upgrade and widen the existing Big Hurrah Mine access road would be a linear feature. The Big Hurrah Mine access road would be required to be culverted, thereby maintaining surface flow and drainage patterns and would have little effect on groundwater recharge.

See Volume 5 Water Management Reports for additional information and Volume 8 Geochemistry and Groundwater Report for additional information.

#### **6.1.10 Wetlands as maintaining baseflows for aquatic resources 320.4(b)(2)(vi):**

##### Rock Creek Mine/Mill Complex

As discussed in the previous section, wetlands aid in the maintenance of baseflows. As a result of direct impacts to more than 300 acres of wetlands, precipitation would runoff the landscape faster, allowing less infiltration to groundwater, and contributing less to creek baseflows. These effects would diminish over time upon site closure and as recovery progresses after reclamation. These effects would be localized around the mine sites and would not be expected to have more than minimal impacts to baseflows of the Snake River watershed and the aquatic resources within that watershed (e.g. habitat for resident fish).

##### Big Hurrah Mine

At the Big Hurrah Mine, any impacts to baseflow would be negligible due to the lack of direct impact upon wetlands.

See Volume 5 Water Management Reports and Volume 8 Geochemistry and Groundwater for additional information.

**6.1.11 Proposed disposal site determinations 230.11(f)(2) (Mixing zone, in light of the depth of water at the disposal site; current velocity, direction, and variability at the disposal site; degree of turbulence; water column stratification; discharge vessel speed and direction; rate of discharge; dredged material characteristics; number of discharges per unit of time; and any other relevant factors affecting rates and patterns of mixing):**

N/A

**6.1.12 Special aquatic sites (Sanctuaries and refuges 230.40, Wetlands 230.41, Mudflats 230.42, Vegetated shallows 230.43, Coral reefs 230.44, Riffle and pool complexes 230.45), wetlands 320.4(a)(1), and 320.4(b)(1) and (2):**

#### Rock Creek Mine Project

Wetlands are special aquatic sites. 240.5 acres of jurisdictional wetlands would be permanently impacted as a result of the proposed project, and there would be 106 acres of wetlands temporarily impacted by organic overburden stockpiles and water management systems. The applicant supplied preliminary jurisdictional determinations which included wetland mapping. The Corps independently reviewed and approved the preliminary jurisdictional determinations.

Wetlands are a common habitat in Alaska and the Nome region. According to the USFWS National Wetland Inventory, approximately ½ of the state of Alaska is wetland. The permanent loss of 240.5 acres of lower value wetlands in the Snake River and Solomon River watersheds is a minimal impact due to the thousands of acres of similar undisturbed wetland in these watersheds. In addition, impacts to the higher value willow dominated wetlands would be avoided and minimized to the maximum extent practicable.

The EID provides a discussion of wetlands in Section 7.7.2 entitled Wetlands on pages 218 and 219. The wetlands impacted within the Rock Creek Mine Project area are primarily palustrine scrub-shrub emergent tundra. Wetland vegetation types include open sedge, alder, low willow shrub, tall willow and dwarf birch.

The Project Description and DA permit application included tabulation of the wetland impacts. Both quantities of fill to be discharged into wetlands, and acreage of footprint in wetlands are shown for several project components in Tables 3-1, 3-2, 3-3, 3-4, 3-5, 3-6, 4-2, 5-1, 5-2, 5-3 of the Project Description.

In response to recommendations by the Corps and the LMPT, the applicant included measures to minimize impacts to wetlands. These measures have been discussed in Sections 3.2 and 3.3 of this document as well as the Project Description and EID. This impact would be mitigated with the inclusion of special conditions, if the permit is issued, to facilitate reclamation and to ensure that there are no impacts to wetlands outside the authorized footprint: 1. All organic materials from excavation, fill pads and roads, development rock stockpiles, and tailings storage areas shall be removed, segregated and stockpiled for use during mine reclamation. *This condition is required to facilitate reclamation of the tailing storage facility, development rock stockpiles, haul roads, water management systems, mill pad, stream corridors, and riparian areas as stated in the Reclamation Plan approved by ADNR. Spreading the organic material at the surface during reclamation promotes revegetation.* 8. All fill and disturbed areas shall be stabilized to prevent erosion. Increased water turbidity and accumulation of sediment in drainages and adjacent wetlands shall be evidence of insufficient stabilization. *This condition is required to prevent sedimentation outside the permitted area [40 CFR PART 230.21 and 230.72].* 9. Project limits of authorized sites shall be clearly identified in the field (e.g., staking, flagging, silt fencing, existing footprint for maintenance activities, etc.) prior to additional clearing and construction to ensure avoidance of impacts to waters of the U.S. (including wetlands) beyond project footprints. No fill or construction materials shall be placed outside the project boundary. *This condition is required to prevent the placement of fill or anything that may have the effect of fill outside the permitted area; thereby, minimizing the area of wetland impacts [40 CFR PART 230.70].* 10. Natural drainage patterns shall be maintained to the maximum extent practicable. If applicable, activities must be designed to maintain preconstruction downstream flow conditions (e.g., location, capacity, and flow rates). Furthermore, activities must not restrict or impede the passage of normal or expected high flows (unless the primary purpose of the fill is to impound waters) and the structure or discharge of dredged or fill material must withstand expected high flows. Stream channelizing shall be reduced to a minimum. Activities must, to the maximum extent

practicable, reduce adverse effects such as flooding, erosion, or scouring downstream and upstream of the project site. Increased scouring, ponding, perching of a culvert, and/or accumulation of sediment in waters of the U.S. shall be evidence of inadequate drainage and noncompliance with this condition. *This condition is required to maintain natural drainage patterns, thereby minimizing impacts to waters of the U.S. and riparian areas [40 CFR PART 230.23].*

#### **6.1.13 Fish, crustaceans, mollusks, and other aquatic organisms in the food web 230.31 and aquatic ecosystem and organism determinations 230.11(e):**

##### Big Hurrah Mine

At the Big Hurrah Mine site, the Upper Little Hurrah Creek would be diverted and flows reduced due to the installation and use of groundwater interception wells. Due to the fact that fish usage of Little Hurrah Creek is minimal at present, the proposed work should cause no more than minimal impacts on fisheries and other aquatic organisms. These effects would be localized around the mine site and would not be expected to have more than minimal impacts to the Solomon River watershed.

Reclamation of the Big Hurrah Mine pit and drainages would re-establish fish habitat as part of the overall mitigation plan for the proposed project. Part of the reclamation includes re-directing Little Hurrah Creek through the main pit lake at Big Hurrah Mine after closure to create overwintering habitat for fish, re-grading, re-contouring, re-application of available topsoil, and re-planting of willows to ensure a stable landform that is an improvement over current conditions. Additionally, the water quality of the pit lake would return to levels similar to or better than background conditions as a result of dilution.

Resident fish in Big Hurrah Creek include Dolly Varden and Arctic grayling. During the construction of the Big Hurrah Mine access road, the main channel of Big Hurrah Creek would be reclaimed and rehabilitated. Reclamation would include the removal and recontouring of previously unreclaimed placer tailings left in and adjacent to the creek to simulate more natural stream and riparian characteristics. The stream would be deepened to assist the stream in reclaiming a main channel in accordance with ADNR OHMP criteria. Additional placer tailings and fill material would come from pits strategically located within the floodplain. Pits within the stream would be designed and located to meet the criteria specified in the Title 41 Fish Habitat Permit issued by ADNR OHMP. The new stream design in Big Hurrah Creek would enhance overwintering fish habitat. This habitat type has been identified as important and lacking in the Solomon River watershed. Additionally, the placer tailings would be removed to bank-full height which simultaneously provides banks for stream establishment while allowing for flood attenuation capacity. Due to the creation of overwintering fish habitat and reclamation of 2.5 miles in Big Hurrah Creek, the projects should provide a net benefit to fish over the long-term, provided that water quality and habitat creation/restoration goals are achieved.

The rehabilitation of Big Hurrah Creek would include replanting or redistributing of willows salvaged from other disturbed areas to increase bank or slope stability. Establishment of riparian vegetation, including willows, would also provide habitat for birds and other wildlife, browse for moose, and shade for fish. The recontouring of the stream would increase sinuosity of the stream channel as well as create pools for fish. Portions of the area are expected to be re-established with wetlands over time.

##### Rock Creek Mine Project

Both creek drainages within the project area have been previously disturbed by historic mining activities. During the life of the mine project, the upper portions of Rock Creek would be diverted and flows to lower Rock Creek would be substantially reduced by the installation and use of groundwater interception wells. Although the upper portions of Rock Creek would be diverted and flows lowered, fish are not present in these waters. Injection wells would be installed to reinject water that has not been used in the mining process and restore groundwater flow. These effects would be localized around the mine site and would not be expected to have more than minimal impacts to the Snake River watershed. Upon closure, most of the surface water diversion ditches would be reclaimed and interception wells de-activated so that pre-project surface and sub-surface flows are essentially restored; therefore, having a short-term negative impact on fish use of the area. After project completion, Rock Creek would be re-established through the pit lake, which should provide over-wintering habitat for resident fish and other aquatic organisms. The lower reaches of Rock Creek provide habitat for pink salmon, Dolly Varden, and probably Arctic grayling.

Therefore, negative impacts to fish and fish habitat in Rock Creek and downstream in the Snake River are expected to be temporary and no more than minimal.

This impact would be mitigated with the inclusion of special conditions, if the permit is issued, to facilitate reclamation and to ensure that there are no impacts to wetlands outside the authorized footprint: 2. Any temporary or permanent standing water that will be created by project-related activities shall be tested and monitored on an ongoing basis over at least a ten year period (and longer, if needed) to determine whether toxicity/pollution levels exist that are harmful to fish, birds or other wildlife. If so, such waters shall be (1) removed immediately (if temporary), (2) treated so that toxicity/pollution is reduced to a level that no longer poses a threat to wildlife, or (3) enclosed by deterrent devices (fencing, netting, weirs, etc.) that prevent wildlife and fish from coming into contact with toxic substances or polluted water. *This condition is required to ensure that pollutants do not enter any surface water that may be utilized by fish and wildlife [40 CFR PART 230.22].* 3. The Lindblom Creek culvert on the Glacier Creek Road shall be replaced with a culvert of sufficient size and design to accommodate the increased flows. The culvert shall be designed to prevent downstream bed degradation from increased flows and allow fish passage. Increased scouring, ponding, perching of the culvert, and/or accumulation of sediment in waters of the U.S. shall be evidence of inadequate drainage and noncompliance with this condition. *This condition is required to have a culvert of sufficient size and design to maintain fish passage and minimize stream bed impacts caused by increased flow rates in Lindblom Creek as a result of diversion of Rock Creek-drainage surface waters above the mine site [40 CFR PART 230.23 and 230.24].* 4. A 50 foot vegetated buffer shall be maintained, to the extent practicable, between the active or rehabilitated Big Hurrah Creek channel and the Big Hurrah access road. *This condition is required to maintain the integrity and functions of the riparian buffer adjacent to Big Hurrah Creek [40 CFR PART 230.21]. Riparian buffers filter surface runoff which can be a source of pollutants.* 5. During Big Hurrah Creek tailings removal and channel/floodplain rehabilitation and re-contouring, the applicant shall minimize destruction of riverine tall willow vegetation. Where necessary to remove this habitat, the applicant shall salvage willows and replant or re-distribute them to increase bank or slope stability and to provide habitat for birds and shade, structure and cover for fish, including in and around newly created pools. *This condition is required to maximize the use of existing vegetation for stream reclamation and to simulate natural habitat for fish [40 CFR PART 230.41].* 8. All fill and disturbed areas shall be stabilized to prevent erosion. Increased water turbidity and accumulation of sediment in drainages and adjacent wetlands shall be evidence of insufficient stabilization. *This condition is required to prevent sedimentation outside the permitted area, thereby minimizing impacts to aquatic organisms [40 CFR PART 230.21 and 230.72].* 9. Project limits of authorized sites shall be clearly identified in the field (e.g., staking, flagging, silt fencing, existing footprint for maintenance activities, etc.) prior to additional clearing and construction to ensure avoidance of impacts to waters of the U.S. (including wetlands) beyond project footprints. No fill or construction materials shall be placed outside the project boundary. *This condition is required to prevent the placement of fill or anything that may have the effect of fill outside the permitted area; thereby, minimizing the impacts to aquatic organisms [40 CFR PART 230.70].* 10. Natural drainage patterns shall be maintained to the maximum extent practicable. If applicable, activities must be designed to maintain preconstruction downstream flow conditions (e.g., location, capacity, and flow rates). Furthermore, activities must not restrict or impede the passage of normal or expected high flows (unless the primary purpose of the fill is to impound waters) and the structure or discharge of dredged or fill material must withstand expected high flows. Stream channelizing shall be reduced to a minimum. Activities must, to the maximum extent practicable, reduce adverse effects such as flooding, erosion, or scouring downstream and upstream of the project site. Increased scouring, ponding, perching of a culvert, and/or accumulation of sediment in waters of the U.S. shall be evidence of inadequate drainage and noncompliance with this condition. *This condition is required to maintain natural drainage patterns, thereby minimizing impacts to aquatic organisms [40 CFR PART 230.23].*

See EID, Section 7.7.5 Essential Fish Habitat, pp. 242-244 and the ADNR OHMP Fish Habitat Permit for additional information.

#### **6.1.14 Essential fish habitat:**

##### Rock Creek Mine Project

The proposed work has been evaluated for possible effects to Essential Fish Habitat (EFH) and coordinated with the National Marine Fisheries Service (NMFS) pursuant to the Magnuson Stevens

Fishery Conservation and Management Act of 1996 [Section III(B)(1)(a)(iii) and Section III(B)(2)(a)]. By electronic correspondence, dated June 12, 2006, NMFS stated that the project will not result in any adverse effect to EFH. Also, no EFH assessment is required and NMFS did not offer any EFH conservation recommendations. Further EFH consultation is not required.

See EID, Section 7.7.5 Essential Fish Habitat, pp. 242-244 and memo from NMFS, dated June 12, 2006, for additional information.

#### **6.1.15 Wildlife 230.32, fish and wildlife values 320.4(a)(1), also fish and wildlife at 320.4(c):**

##### Rock Creek Mine Project

The EID includes a discussion of wildlife (specifically, mammals, furbearers and birds) and wildlife habitats. The project area was mapped for habitat types at both Rock Creek and Big Hurrah Mine sites. The mine would result in short-term disruption of wildlife use patterns at the two mine sites. However, wildlife typically adjusts to this type of disturbance by moving to nearby undisturbed areas where similar habitat types exist. There are more than 54,400 acres of similar habitat in the Snake River watershed, and this project area (EID, Section 7.5 Hydrology and Water Quality, p. 56). Due to the fact that these habitat types are abundant in and around the project area, no more than minimal impacts to wildlife habitat are anticipated as a result of the proposed project.

The USFWS identified high value habitat in the area as that used by moose, brown bears, caribou and reindeer, muskoxen, wolves, foxes, furbearers, as well as the following avian species: gray-cheeked thrush; fox sparrow; Arctic, blackpoll, orange-crowned, Wilson's and yellow warblers; northern waterthrush; water fowl; ptarmigan; and shorebirds. Impacts to the high value habitat would be avoided and minimized to the maximum extent practicable.

Rock Creek, a tributary of the Snake River, downstream of the project site provides habitat for pink salmon, Dolly Varden, and probably Arctic grayling. The Snake River downstream of Rock Creek also supports anadromous fish: Chinook, coho, and chum salmon, and whitefish. Most of the surface water diversion ditches would be reclaimed and interception wells de-activated so that pre-project surface and sub-surface flows are restored. Therefore, negative impacts to fish and fish habitat in Rock Creek and downstream in the Snake River are expected to be temporary and no more than minimal.

Resident fish in Big Hurrah Creek include Dolly Varden and Arctic grayling. Due to the creation of overwintering fish habitat and reclamation of 2.5 miles in Big Hurrah Creek, the projects should provide a net benefit to fish over the long-term, provided that water quality and habitat creation/restoration goals are achieved.

The impacts to fish and wildlife would be mitigated with the inclusion of special conditions, if the permit is issued, to facilitate reclamation and to ensure that there are no impacts to wetlands outside the authorized footprint: 2. Any temporary or permanent standing water that will be created by project-related activities shall be tested and monitored on an ongoing basis over at least a ten year period (and longer, if needed) to determine whether toxicity/pollution levels exist that are harmful to fish, birds or other wildlife. If so, such waters shall be (1) removed immediately (if temporary), (2) treated so that toxicity/pollution is reduced to a level that no longer poses a threat to wildlife, or (3) enclosed by deterrent devices (fencing, netting, weirs, etc.) that prevent wildlife and fish from coming into contact with toxic substances or polluted water. *This condition is required to ensure that pollutants do not enter any surface water that may be utilized by fish and wildlife [40 CFR PART 230.22].* 3. The Lindblom Creek culvert on the Glacier Creek Road shall be replaced with a culvert of sufficient size and design to accommodate the increased flows. The culvert shall be designed to prevent downstream bed degradation from increased flows and allow fish passage. Increased scouring, ponding, perching of the culvert, and/or accumulation of sediment in waters of the U.S. shall be evidence of inadequate drainage and noncompliance with this condition. *This condition is required to have a culvert of sufficient size and design to maintain fish passage and minimize stream bed impacts caused by increased flow rates in Lindblom Creek as a result of diversion of Rock Creek-drainage surface waters above the mine site [40 CFR PART 230.23 and 230.24].* 4. A 50 foot vegetated buffer shall be maintained, to the extent practicable, between the active or rehabilitated Big Hurrah Creek channel and the Big Hurrah access road. *This condition is required to maintain the integrity and functions of the riparian buffer adjacent to Big Hurrah Creek [40 CFR PART*

230.21]. *Riparian buffers filter surface runoff which can be a source of pollutants.* 5. During Big Hurrah Creek tailings removal and channel/floodplain rehabilitation and re-contouring, the applicant shall minimize destruction of riverine tall willow vegetation. Where necessary to remove this habitat, the applicant shall salvage willows and replant or re-distribute them to increase bank or slope stability and to provide habitat for birds and shade, structure and cover for fish, including in and around newly created pools. *This condition is required to maximize the use of existing vegetation for stream reclamation and to simulate natural habitat for fish and wildlife [40 CFR PART 230.41].* 6. To reduce the potential for bird collisions with the proposed power line (if line burial is not feasible), bird diverter devices shall be installed and maintained within one quarter mile on either side of the new Glacier Creek Bridge. Diverters shall be spaced not more than 65 feet apart and alternate between outside wires. Power line poles and transmission lines also shall be designed to meet Avian Power Line Interaction Committee (APLIC) standards for reducing the likelihood of bird electrocution (<http://www.aplic.org>). *This condition is intended to reduce the likelihood of the impacts prohibited by the Migratory Bird Treaty Act [40 CFR PART 230.32].* 7. The applicant shall work with USACE, USFWS, EPA, and ADNOR OHMP to identify and implement additional mitigation opportunities in the project areas that will benefit birds. The plan shall be submitted to the Corps for review and approval within one year from the date of the approved DA permit. *The condition has been adopted due to concerns from EPA and USFWS. This condition is carried to identify other on-site mitigation opportunities that will benefit wildlife, in particular avian species [40 CFR PART 230.32].* 8. All fill and disturbed areas shall be stabilized to prevent erosion. Increased water turbidity and accumulation of sediment in drainages and adjacent wetlands shall be evidence of insufficient stabilization. *This condition is required to prevent sedimentation outside the permitted area, thereby minimizing impacts to fish and wildlife [40 CFR PART 230.21 and 230.72].* 9. Project limits of authorized sites shall be clearly identified in the field (e.g., staking, flagging, silt fencing, existing footprint for maintenance activities, etc.) prior to additional clearing and construction to ensure avoidance of impacts to waters of the U.S. (including wetlands) beyond project footprints. No fill or construction materials shall be placed outside the project boundary. *This condition is required to prevent the placement of fill or anything that may have the effect of fill outside the permitted area; thereby, minimizing the impacts to fish and wildlife [40 CFR PART 230.70].* 10. Natural drainage patterns shall be maintained to the maximum extent practicable. If applicable, activities must be designed to maintain preconstruction downstream flow conditions (e.g., location, capacity, and flow rates). Furthermore, activities must not restrict or impede the passage of normal or expected high flows (unless the primary purpose of the fill is to impound waters) and the structure or discharge of dredged or fill material must withstand expected high flows. Stream channelizing shall be reduced to a minimum. Activities must, to the maximum extent practicable, reduce adverse effects such as flooding, erosion, or scouring downstream and upstream of the project site. Increased scouring, ponding, perching of a culvert, and/or accumulation of sediment in waters of the U.S. shall be evidence of inadequate drainage and noncompliance with this condition. *This condition is required to maintain natural drainage patterns, thereby minimizing impacts to fish and wildlife [40 CFR PART 230.23].*

See EID, Section 7.7.1 Habitat Types, pp. 207-218, Section 7.7.3 Mammals, pp. 219-220, Section 7.7.4 Avian Resources, pp. 221-242; and, EID Appendix, Biological Resources for additional information.

#### **6.1.16 Threatened and endangered species 230.30:**

##### Rock Creek Mine Project

The project was coordinated with USFWS and NMFS. The project is within the migratory ranges of the spectacled eider and the Alaska-breeding population of Steller's eider, both listed as threatened under the Endangered Species Act. Neither species has been recently documented as breeding in the Nome area, nor do the proposed project areas constitute potentially suitable breeding, molting or resting habitats. The Corps determined the project was not likely to adversely affect these listed species and the USFWS concurred. No threatened or endangered species were identified by NMFS. Therefore, no threatened or endangered species would be adversely affected by the proposed action.

See EID, Section 7.7.6 Threatened and Endangered Species, p. 244 for additional information.

**6.1.17 Contaminant determinations 230.11(d) and 230.60:** (NOTE: The analysis of this factor includes discussion of potentially acid generating rock)

## Rock Creek Mine/Mill Complex

Metal leaching naturally occurs in the area of Rock Creek Mine/Mill Complex and can be observed in groundwater emerging from mineralized zones. The mineralized zones are located within the defined pit boundaries. Metals, such as arsenic, antimony, and molybdenum, are naturally present in the geology of the Rock Creek Mine/Mill Complex and are found at concentrations which could, if mobilized into the environment, pose a small environmental risk. Detailed analysis of development rock was completed at the Rock Creek Mine/Mill Complex, which identified no potentially acid generating (PAG) development rock.

The milling process would produce paste tailings which would be deposited in a TSF. The TSF would consist of a rockfill embankment with an upstream high-density polyethylene geomembrane liner that would extend from the face of the dam into the bedrock and a seepage collection system. The tailings would be deposited along the upstream limits of the TSF basin, with process solution and precipitation being collected and recycled to the mill. The tailings would be deposited at a slope of 6 percent from the basin limits down to the embankment. Water remaining in the TSF at mine closure would be treated to applicable State water quality standards and discharged into the groundwater injection system. The tailings surface would then be capped with a minimum 3.3 foot layer of development rock. This cap would minimize infiltration of precipitation into the tailings. In some areas, additional development rock would be applied to support the equipment spreading the capping material. Stockpiled organic material would be spread on the capped tailings deposit in a layer about 12 inches thick and re-seeded with native grasses. Only minor re-grading of the development rock and organic material cap would be required to promote surface drainage. A spillway (this is the "breach" referred to in Plan of Operations, Volume 4 Reclamation Plan, p. 17) would be constructed at the low point of the development rock and organic material cap to allow surface water runoff to flow into re-established pre-mining drainages. The rockfill embankments would not be re-graded or breached during reclamation. Without infiltration of precipitation into tailings, seepage out of the tailings would cease approximately three years after closure. Drainage and/or seepage from the reclaimed TSF during this period would be caught in the seepage collection system and monitored to determine if it meets applicable State water quality standards. If the drainage and/or seepage does not meet applicable State water quality standards, then the water would be treated and discharged through the groundwater injection system. When monitoring indicates that no further treatment would be required, then surface flow would run down the natural flow path of the Rock Creek watershed. The project is designed so that no tailings would leave the TSF.

Modeling predicted that metal leaching would not occur from the TSF. The modeling also predicts that water quality from the TSF would not exceed water quality standards at abandonment or during operation. The ADEC Waste Management Plan has been approved for the TSF site.

## Big Hurrah Mine

Arsenic and antimony are found at concentrations in the geology which could, if mobilized into the environment, pose a small environmental risk. Detailed analysis was completed at for the proposed development rock. The tests were designed to determine if the rock would be acid generating, and thus, have a potential to leach metals from development rock. Some development rock at Big Hurrah Creek was identified as PAG. This material would be sampled and analyzed to determine whether it is PAG or non-acid generating (NAG) during mining as it is removed from the pit. The PAG and NAG will be handled and stored separately within the mine site. The PAG would be temporarily stacked and stockpiled on a separate pad, the satellite pit, which would be contained (graded and lined) to prevent surface runoff containing contaminants. If the surface water does contain contaminants, it would be treated before discharge into the injection wells. During final reclamation, the PAG would be taken from the satellite pit, deposited in the main pit, compacted, capped with NAG development rock, and compacted again. The pit would then be allowed to fill with water, reducing exposure of the PAG to the air, thereby eliminating the potential for acid generation.

Monitoring would ensure that elemental concentrations have not mobilized, and verify the SWPPP is working correctly. The runoff water reports would then be analyzed by the State of Alaska to ensure compliance with all water quality standards. Any problems noted would be immediately corrected by the applicant.

### Rock Creek Mine Project

There would be no more than minimal impact to the environment from potential contaminants. The ADEC 401 Certificate includes a condition to prevent contaminants from entering streams or wetlands (see Section 6.3, ADEC condition 3). This impact would be mitigated with the inclusion of a special condition, if the permit is issued, to prevent contaminants from entering streams or wetlands: 2. Any temporary or permanent standing water that will be created by project-related activities shall be tested and monitored on an ongoing basis over at least a ten year period (and longer, if needed) to determine whether toxicity/pollution levels exist that are harmful to fish, birds or other wildlife. If so, such waters shall be (1) removed immediately (if temporary), (2) treated so that toxicity/pollution is reduced to a level that no longer poses a threat to wildlife, or (3) enclosed by deterrent devices (fencing, netting, weirs, etc.) that prevent wildlife and fish from coming into contact with toxic substances or polluted water. *This condition is required to ensure that contaminants do not enter any surface water that may be utilized by fish and wildlife [40 CFR PART 230.22].*

See EID, Section 7.3.2 Acid Rock Drainage and Metal Leaching Potential, pp. 45-52; Tailings Alternatives Analysis; Volume 4, Plan of Operations; and, ADEC Waste Management Permit, for additional information.

### **6.1.18 Water supply and conservation 320.4(a)(1) and 320.4(m), Municipal and private water supplies 230.50:**

#### Rock Creek Mine Project

The drinking water source for the Nome community is Moonlight Springs, located near the southern base of Anvil Mountain in an adjacent valley. Moonlight Springs is not hydrologically connected to any of the waters affected by the project; therefore, the proposed project would not have any effect on municipal water supplies.

### **6.1.19 Recreational and commercial fisheries 230.51:**

#### Rock Creek Mine Project

The locations upstream of the Snake River and Solomon River are traditionally not recreational fisheries. The project is located on private property, which also prevents the area from being used as a recreational fishery. No commercial fishing occurs on the Snake River or the Solomon River or their upstream tributaries. The Corps has determined that there would be no impact to recreational and commercial fisheries.

See EID, Section 7.2 Past and Present Land Use, pp. 39-42 for additional information.

### **6.1.20 Subsistence:**

#### Rock Creek Mine Project

Subsistence in the Nome area consists of hunting, fishing, and gathering various plants and berries. Hunting, fishing and gathering materials are used by the residents for food, clothing and other everyday living supplies. Subsistence activities have coexisted with the presence of mining activities in this area for more than 100 years. This trend would be expected to continue uninterrupted throughout the life of the proposed mines at Rock Creek and Big Hurrah (4 to 5 years). Since there is undisturbed land around both mine sites, animal migration and movement should continue unabated. Animals and hunters would simply be displaced from the immediate vicinity of the mines.

Reindeer herding is the only present or past commercial activity related to subsistence within the Snake River and Big Hurrah valleys. The Rock Creek Mine/Mill Complex is a private in-holding within the Davis grazing unit. These lands are owned by the applicant and Sitnasuak Native Corporation. No grazing permits or agreements have been established in the recent past for use of these lands for the Davis reindeer herd. The Big Hurrah Mine is a private in-holding within the Gray grazing unit. The land is wholly owned by the applicant and no past or present grazing permits have been established for the use

of these lands for the Gray reindeer herd. Neither mine site is located within a high-use grazing area. The lack of grazing land agreements at either of these sites presently or in the recent past indicates that use of these lands for mineral development does not represent a direct loss of range to the herd(s). The availability of open land on all sides of both mine sites adequately allows reindeer movement throughout the area. Due to the fact that the Rock Creek mining claims (at both locations) and all of the applicant's lands have been and would remain closed to public access, subsistence on surrounding lands should not be adversely impacted by the proposed work.

The Solomon River and the Snake River are traditionally used for subsistence fisheries. The upstream tributaries affected by the mine are not currently used for subsistence fisheries, and the tributaries affected by the mine are far enough upstream to have no more than minimal impacts downstream of the project area in the Solomon and Snake Rivers.

Subsistence fish camps are located adjacent to the Nome-Council Highway. These fish are not caught in the Snake River watershed or in Big Hurrah Creek. Open-air fish racks are used at these subsistence fish camps to dry fish during the summer fish runs. Vehicular traffic along the Nome-Council Highway, an unpaved road, causes dust to settle on the subsistence camps, including open-air fish racks. The project would increase vehicular traffic on the Nome Council Highway and generate more dust. This impact would be mitigated with the inclusion of special conditions, if the permit is issued, to minimize dust generation: 11. The applicant shall develop a plan with the Alaska Department of Transportation and Public Facilities on dust minimization, especially around subsistence areas and fish racks, prior to hauling ore from Big Hurrah Mine. *This condition was requested by EPA, and agreed to by the applicant, to minimize contact between dust generated by vehicles on the Nome Council Highway, an unpaved road, with Native-owned open-air fish drying racks.*

#### **6.1.21 Water-related recreation 230.52, recreation 320.4(a)(1):**

N/A. No water-related recreation currently exists within the Rock Creek Mine Project area.

#### **6.1.22 Aesthetics 320.4(a)(1) and 230.53:**

##### Rock Creek Mine/Mill Complex

The proposed Rock Creek Mine/Mill Complex would not be visible from the city of Nome, except at the western edge of town beyond the airport. Lights from the proposed mine would be visible from the lower Snake River Valley, including from the Nome-Teller Highway where it crosses the valley. Along most of the new Glacier Creek Bypass Road and several surrounding hillsides, an observer would have a clear view of the mine.

Visual impacts from the proposed Rock Creek Mine/Mill Complex would occur. The disturbance as a result of the mine would stand out in the landscape. After completion of mining, revegetation for the entire mined area would take years.

##### Big Hurrah Mine

The Big Hurrah Mine would not be visible from the main highway system or any nearby community. The proposed mine would likely be visible from higher elevations along the surrounding slopes and mountains.

##### Rock Creek Mine Project

The existing landscape in the Nome area has been strongly influenced by mining. Mining was the original stimulus for economic development in the area and active mining equipment as well as historic remnants remain prominent features on the landscape. This evidence of mining is part of the tourist attraction for Nome.

Both sites have previously been disturbed by placer and/or hard-rock mining. Tailing piles that had not been previously reclaimed prior to the project would be re-contoured and reclaimed as a result of

mitigation for the proposed project. No more than minimal impacts to existing aesthetics are anticipated as a result of the proposed project.

See EID, Section 7.9.8 Visual, pp. 306-313; and, EID Appendix, Visual for additional information.

**6.1.23 Wild and Scenic Rivers, National Wilderness Areas, National Seashores, National Parks, estuarine and marine sanctuaries 320.4(e), and for marine sanctuaries also 320.4(i), Parks, national and historic monuments, national seashores, wilderness areas, research sites, and similar preserves 230.54:**

N/A. The Rock Creek Mine Project area is not within any, nor does it affect any, Wild and Scenic rivers, National Wilderness Areas, National Seashores, National Parks, estuarine and marine sanctuaries, marine sanctuaries, parks, national and historic monument, national seashores, wilderness areas, research sites, and similar preserves.

**6.1.24 Energy needs 320.4(a)(1) and energy conservation and development 320.4(n):**

Rock Creek Mine Project

Energy would be consumed during the development, operation, and reclamation of the mine. Gasoline and diesel fuel would be consumed in the mining equipment such as: dozers, front end loaders, haul trucks, compactors, graders, and support trucks. The project would use approximately 1,000,000 gallons of diesel fuel a year. The fuel would be barged into Nome in the summer and stored in tanks at the City of Nome port, and then trucked to the mine sites. The additional use of fuel and power would have no more than minimal impacts on energy conservation in the region.

Rock Creek Mine/Mill Complex

A new 25 kilovolts (kV) power line would connect the Rock Creek Mine/Mill Complex and the Nome Joint Utilities System. Power poles would be placed within existing roads' right-of-way and the new access road right-of-way to the Rock Creek Mine/Mill Complex. Holes would be augered to place the poles, and then be backfilled for stability. The construction of a power line would not result in more than minimal impacts.

See EID, Section 5.6 Power, p. 32, and Section 5.8 Fuel Storage, pp. 33-34 for additional information.

**6.1.25 Navigation 320.4(a)(1) and 320.4(o):**

No effects on navigation would result from the Rock Creek Mine Project because none of the waters of the U.S. in which the project would be located are capable of supporting navigation.

**6.1.26 Effects on limits of the territorial sea 320.4(f): N/A**

**6.1.27 Activities affecting coastal zones 320.4(h):**

The ADNR OPMP by letter dated July 31, 2006, concurred that the Rock Creek Mine Project is consistent with the Alaska Coastal Management Program (ACMP). Rock Creek and Big Hurrah Creek have been mined extensively in the past hundred years, so the project would be fitting with the past activities near the Nome coast.

**6.1.28 Safety 320.4(a)(1), also safety of impoundment structures at 320.4(k):**

Rock Creek Mine Project

The project would be subject to the MSHA and their operating rules for safety. It shall be the applicant's responsibility to abide by the MSHA safety requirements and rules. MSHA completes regular inspections. The proposed designs for the tailings storage facility and dams have been reviewed for adequacy by the State of Alaska and have been certified and approved by the State of Alaska Dam Safety Engineer. These findings are considered conclusive with regard to dam safety (33 CFR 325.1(d)(6)).

Ore haulage on the highways would be subject to Alaska Department of Transportation requirements for truck safety, load limit equipment operation, and inspection. It is the responsibility of the company to follow the rules of the road and to run safe trucks. All rules of the road would be enforced by the City of Nome and the Alaska State Troopers. With adherence to these requirements, and use of the Nome Bypass Road, potential problems would be reduced.

See EID, Section 8.2.1 Big Hurrah Mine Traffic Assumptions, p.319, and the ADNR Certificate of Approval to Construct a Dam for additional information.

**6.1.29 Historic properties (Section 301(5) National Historic Preservation Act) 320.4(a)(1) and 320.4(e):**

Rock Creek Mine Project

Two cultural resource surveys have been conducted of the proposed sites. In January 2004, a report titled *Cultural Resources Survey of Proposed Mining Development Activities in the Rock Creek Area, Nome, Alaska* was prepared by Northern Land Use Research, Inc. In that report, one site (NOM-129) was identified as being eligible to the National Register of Historic Places (NRHP). Also in this report, sites NOM-096, NOM-097, NOM-127, NOM-128, NOM-130, NOM-131, NOM-132, NOM-133, NOM-134, NOM-135, and NOM-136 were identified as not being eligible to the NRHP. In September 2005, a second report titled *Cultural Resources Survey for Proposed Mining Development Activities in the Big Hurrah Creek Area, Seward Peninsula, Alaska* was prepared by Northern Land Use Research, Inc. In this report, a historic district (SOL-136) was identified as being eligible to the NRHP and this district consists of 16 contributing elements identified as SOL-153, SOL-154, SOL-155, SOL-156, SOL-157, SOL-158, SOL-159, SOL-160, SOL-161, SOL-162, SOL-163, SOL-164, SOL-165, SOL-166, SOL-167, and SOL-168. The Corps concurred with the findings in these two reports, in a letter dated July 13, 2006, and forwarded our conclusions to the State Historical Preservation Office (SHPO). By letter dated July 27, 2006, SHPO concurred with the Corps findings regarding eligibility of these properties to the NRHP, and agreed that a Memorandum of Agreement (MOA) be developed. The MOA would specify how the eligible properties would be avoided or otherwise mitigated. No other historic properties eligible to the NRHP were identified within the project area at the Rock Creek Mine/Mill Complex. This impact would be mitigated with the inclusion of a special condition, if the permit is issued: 12. A Memorandum of Agreement between the Corps, State Historic Preservation Office, and Alaska Gold Company shall be developed. Properties at the Rock Creek Mine/Mill Complex shall be avoided. Properties at the Big Hurrah Mine Site shall be avoided or mitigated, should avoidance not be possible. The MOA shall be finalized prior to any ground disturbance at the Big Hurrah Mine site. *This condition is required to protect historic properties that are eligible for the NRHP, pursuant to the National Historic Preservation Act and its implementing regulations at 36 CFR PART 800.6(c) and the Interim Guidance for implementing 33 CFR PART 325 Appendix C.*

See EID, Section 7.8 Cultural and Archaeological Resources, pp. 244-255; and, EID Appendix, Archaeological and Cultural Resources for additional information.

**6.1.30 Land use 320.4(a)(1):**

The Rock Creek Mine Project is located on lands historically used for mineral extraction. Part of the property is owned by the applicant and the remainder is leased from Native Corporations for the primary purpose of constructing a mining operation. The proposed project is consistent with past and present land designations.

See EID, Section 7.2 Past and Present Land Use, pp. 39-43, and Section 8.2.3 Past and Present Land Use, pp. 320-322 for additional information.

### **6.1.31 Conservation 320.4(a)(1):**

#### Rock Creek Mine Project

Operation of the Rock Creek Mine Project would incorporate conservation practices where possible: water would be pumped to the Mill Recycle Water Pond for recycle back to the process plant; overburden would be stockpiled for use during reclamation; the Big Hurrah Mine is an area that was previously mined and proposed to be reworked; operations have been designed to reduce double-handling efforts which would require additional fuel and wear and tear on equipment; facility siting was located with avoidance and minimization efforts as well as operation efficiency in mind. However, the Rock Creek Mine Project would result in the overall loss of conservation factors such as available minerals and wetlands during operation of the mines. Any effects would be no more than minimal.

### **6.1.32 Economics 320.4(q) (employment, tax revenues, community cohesion, community services, property values):** (NOTE: The analysis for this factor applies to the Rock Creek Mine Project)

Regional growth: With the addition of up to 135 jobs for the project and an estimated total new employment impact at 208 new jobs for the community, growth for the community would at least temporarily increase. Workers of the Rock Creek Mine Project and their families that moved from other locations in the region, as well as those from outside the region, may decide to permanently reside in Nome after project completion. Also, some new businesses that started to provide service to the project may decide to stay in Nome after project completion. It is anticipated that the project would have a positive impact on regional growth.

See EID, Section 7.9.2 Economics, pp. 261-274 for additional information.

Employment: Total project manpower is anticipated to be around 135 individuals for the currently identified 4 to 5 year life of the mine. It is anticipated that most of the workers would come from residents of the city and outlying villages. It is estimated that 208 new jobs would be created due to the mine and mine service and support facilities.

See EID, Section 7.9.2.3 Environmental Consequences: Economics, pp. 272-274 for additional information.

Tax revenues: The primary impact in the municipal financial sector would be a result of local government taxation of new residential development and increased personal spending driven by project employment and spending. It is anticipated that 27 new housing units could be constructed to accommodate the increased demand for housing due to the project. This would provide new property tax revenues for the City. Also, the economic benefit of direct wages and indirect local expenditures spent locally would be subject to the local sales tax, which would result in additional municipal tax revenue to the City of Nome.

See EID, Section 7.9.5.2 Environmental Consequences: Local Government, pp. 289-290 for additional information.

Community Cohesion: Since mining began in the Nome area in 1865, mining has been and still is an important part of the Nome community. Today, the Nome District contains more than 17,000 acres of patented mining claims with many mining operations and local businesses involved in mining. The historic importance of mining to Nome is demonstrated by statues of the *Three Lucky Swedes* erected in the city center. The *Three Lucky Swedes* were the historic miners who started the Nome gold rush. Comments received during our public meeting held in Nome on June 26, 2006 and on our public notice issued June 1, 2006, indicated a show of public support for the project. It appears that the majority of individuals within the community are in favor of the project; however, many were concerned about the environmental consequences of the project.

See EID, Section 7.9.2 Economics, pp. 261-274; and, Table 1: List of Comment Letter Topics and Responses for additional information.

Community services: The City of Nome is the supply, service and transportation center of the Bering Strait region. The largest contributor to the Nome economy is government services. Government services

provide the majority of employment for residents for a total of 456 workers in the Nome area. Nearly 30% of Nome's workers were employed by the city, state, or federal government during 2000.

Additional housing would potentially be needed for the 18 employees outside the region and the 69 employees from the outlying villages. These additional employees may require community services such as health care services, special care facilities, child care, family and youth services, education facilities, parks and recreation facilities, law enforcement, emergency services, telecommunication services, and public utilities. The Corps has determined that compared to the 3,500 residents in the city, the addition of these employees would have no more than a minimal impact on community services.

See EID, Sections 7.9.3 Community Facilities and Services, pp. 274-282, and Section 7.9.5 Local Government Organization, Powers, Finances, pp. 286-290; and, EID Appendix, Socio-Economic for additional information.

Business activity: The applicant expects to spend \$4,500,000 within Alaska for goods and services. Local businesses including fuel, food, lodging, storage, construction, transportation, flight services and other services may benefit from expenditures associated with the work. For example, employees of the mine would be lodging in the city of Nome, which would provide an economic benefit to the lodging industry.

See EID, Section 7.9 Socioeconomic and Community Impacts, pp. 255-313; and, EID Appendix, Socio-Economics for additional information.

Property values: Since the Rock Creek Mine Project is located on land owned partially by the applicant and the remainder leased from Native Corporations for mining purposes, the value of the property should temporarily increase while the mine is in operation and may fluctuate with the price of gold. With the arrival of new workers and possibly businesses in the community due to the project and shortage of housing, property values in the area are anticipated to increase.

See EID, Section 7.9 Socioeconomic and Community Impacts, pp. 255-313 for additional information.

**6.1.33 Prime and unique farmland (7 CFR Part 658):** N/A

**6.1.34 Food and fiber production 320.4(a)(1):** N/A

**6.1.35 Mineral needs 320.4(a)(1):**

#### Rock Creek Mine Project

One of the mineral needs of the project was identified as the recovery of gold. The gold would be removed from the ground, recovered and sold. The recovered gold would be permanently removed from the two mines. This is an irretrievable and permanent loss of minerals.

All internal development rock at the Rock Creek Mine/Mill Complex would come from the pit development. The material within the pit boundary not suitable for mill feed would be used as development rock on the internal access roads and pads. The Big Hurrah Mine would utilize placer tailings for the main access road to the mine. Development rock would be used to construct the internal mine roads at Big Hurrah. Additional quarries of gravel or rock do not need to be opened within either watershed, which minimizes impacts to waters of the U.S. and uplands.

See Project Description Volume 1, Section 2.0 Project Resources, pp. 4-8, and Section 3.6 Haul Roads, p. 17 for additional information.

**6.1.36 Considerations of property ownership 320.4(a)(1), also at 320.4(g):**

#### Rock Creek Mine/Mill Complex

Approximately 66% of land, surface and subsurface, at the Rock Creek Mine/Mill Complex is owned by the applicant. Of the remaining 34% of land at the Rock Creek Mine/Mill Complex, the surface is owned

by the Sitnasuak Native Corporation and the subsurface is owned by the regional corporation, Bering Straits Native Corporation.

### Big Hurrah Mine

All mining land, surface and subsurface, at the Big Hurrah deposit is owned by the applicant. The road to Big Hurrah is located on Solomon Native Corporation lands. Adjacent landowners (i.e., City of Nome and Community of Solomon) received the DA public notice and were provided the opportunity to comment on the proposed project.

See EID, Section 7.2.1.1 Affected Environment, pp. 39-40 for additional information.

### **6.1.37 General environmental concerns 320.4(a)(1), also environmental benefits at 320.4(p):**

#### Concerns:

The transportation of all hazardous materials must be in compliance with the USDOT rules for cargo transport as they are transported to the project area. Impacts from spills would be minimized by meeting all required MSHA and USDOT requirements, and the conditions on the ADEC 401 Certificate.

Explosives for the Rock Creek Mine Project would be in the form of ammonium nitrate. The storage of ammonium nitrate must be in compliance with MSHA regulations at both mine sites. The ammonium nitrate would be barged to Nome. The initiators and boosters for the explosives would be flown to Nome separately according to USDOT and MSHA requirements.

Although the potential for fuel and oil spills exists at both mines as trucks and equipment are fueled and serviced, the likelihood of spills not being properly contained is remote. This potential is minimized by allowing fueling and servicing to occur only in specific areas. Also, the potential for spills exists as the trucks haul cargo within the mine sites. Spills could potentially occur during handling of bulk fuel and oil as well. Impacts from spills would be minimized by meeting all MSHA requirements. Also, the ADEC 401 Certificate includes several conditions to minimize impacts from spills (see Section 6.3, ADEC conditions 1, 2, and 5).

All hazardous materials would have to be stored and handled in compliance with MSHA requirements. Specific MSHA rules for cyanide must be followed. All cyanide would be barged in to Nome and then trucked to the Rock Creek Mine/Mill complex for the milling process. There would not be any cyanide at the Big Hurrah Mine site.

See EID, Section 5.8 Fuel Storage, p. 33, and Section 5.9 Explosives Storage, p. 34 for additional information.

#### Benefits:

Reclamation of previously unreclaimed placer tailings would improve fish habitat at Big Hurrah Creek. The Rock Creek mine pit would be expected to provide for overwintering of resident fish. Upon completion of reclamation it is anticipated that willow habitat, which has been identified as higher value avian habitat, would re-establish over time. Additionally, the temporary organic overburden stockpiles and the water management systems would be reclaimed and restored to waters of the U.S. Reclamation of the uplands would include recontouring and seeding side slopes of the development rock stockpiles and the TSF.

Existing metal leaching would be reduced as a result of mining of the ore bodies and reclamation of the sites. Metal leaching naturally occurs in the area of Rock Creek Mine/Mill Complex and Big Hurrah Mine and can be observed in groundwater emerging from mineralized zones. The mineralized zones are located within the defined pit boundaries. Metals, such as arsenic, antimony, and molybdenum, are naturally present in the geology of the Rock Creek Mine Project and are found at elemental concentrations which could, if mobilized into the environment, pose a small environmental risk. By mining the material and removing the ore body, the metal leaching would thereby be reduced from both sites.

See Volume 4 Reclamation Plan for additional information.

**6.1.38 Other federal, state, or local requirements 320.4(j):**

The following are federal, state, and/or local requirements the applicant would need to meet other than the DA permit for the Rock Creek Mine Project. ADEC Waste Management Permit, ADNR Temporary Water Use Authorizations, ADNR OHMP Fish Habitat Permit, ADNR Rock Creek and Big Hurrah Mine Project Final Reclamation Plan and Approval, ADNR OPMP Coastal Zone Consistency Determination, ADEC 401 Certificate, USDOT for hazardous materials and cargo transport, EPA Stormwater Pollution Prevention Plan, BATFE Permit and License for use of explosives, ADNR Certificate of Approval to Construct a Dam, EPCRA, MSHA, U.S. Coast Guard regulations for Explosives Handling. The applicant has either obtained or is in the process of obtaining the above requirements.

**6.1.39 Secondary and Cumulative Impacts 230.11(g) and 230.11(h) (effects on the aquatic ecosystem, associated with discharge of fills), also 320.4(a)(1):**

Secondary Impacts:

Measures have been incorporated by the project design, the ADEC 401 Certificate, and the special conditions of the DA permit, if issued, to minimize impacts to downstream fisheries at both mines. In the event that water quality standards are exceeded by stormwater runoff and/or petroleum or chemical spills occur at either mine site, the applicant would have to meet ADEC and EPA compliance directives.

Spills during transportation of hazardous material, including cyanide, fuel, and oil could result in contamination of the spill site. These locations would have to be cleaned up according to ADEC and EPA requirements. Proper labeling and Material Safety Data Sheets for all materials would have to be completed and filed with the local responding agency, the City of Nome. Notification and training requirements would have to be completed by the applicant and the City of Nome.

There would be a positive effect on the land owners and the lease holders as production royalties are distributed. Employment opportunities would increase within the region, which in turn would stimulate the Nome local economy.

The City of Nome would have to increase power generation capacity to meet the Rock Creek Mine/Mill Complex energy needs. Diesel fuel consumption would increase for the duration of mine operations.

Use of the Glacier Creek Bypass Road for access to the Rock Creek Mine/Mill Complex reduces vehicular traffic and associated impacts, including contaminant spills, and adverse impacts to Moonlight Springs, the drinking water source for the City of Nome.

Upgrading of the Glacier Creek Bypass Road would ease access to the Rock Creek Mine/Mill Complex, which in turn would entice locals to use the road for other uses, including hunting, berry-picking, tourism, fishing, hiking, bird watching, gold panning, subsistence, etc. Increased human activity and vehicle traffic may cause minor disruptions to wildlife.

Use of the Nome Bypass Road by company trucks would reduce congestion and dust on First Avenue in the City of Nome; and, improves traffic safety and reduces noise for the citizens of Nome.

Pit lake filling at both Rock Creek and Big Hurrah Mines would result in inundation of both wetland and upland habitats with water. In fact, the Rock Creek mine pit would be expected to provide overwintering habitat for resident fish. The proposed mitigation and reclamation would benefit subsistence and recreation in the area.

Metal leaching would be reduced as a result of mining of the ore bodies and reclamation of the sites. Metal leaching naturally occurs in the area of Rock Creek Mine/Mill Complex and Big Hurrah Mine and can be observed in groundwater emerging from mineralized zones. The mineralized zones are located within the defined pit boundaries. Metals, such as arsenic, antimony, and molybdenum, are naturally present in the geology of the Rock Creek Mine Project and are found at elemental concentrations which

could, if mobilized into the environment, pose a small environmental risk. By mining the material and removing the ore body, the metal leaching would thereby be reduced from both sites.

Noise levels are expected to be higher during the initial construction phase. Once construction is complete, the major source of noise would be blasting, heavy equipment at the mine sites, and trucks on the highways. Because the mine site activities are situated far from the city limits, noise impacts from blasting and heavy equipment at the mine site would be no more than minimal outside of the immediate area.

Traffic on the unpaved haul road and access roads generates dust. This is the normal condition in Nome; however, the addition of more trucks would incrementally add to dust generation. Dust in subsistence areas may land on fish drying racks and cabins that are near roads. Fugitive dust would be visible along the Nome Bypass Road and other unpaved roads. ADEC is responsible for issuing the Air Quality Permits. This impact would be mitigated with the inclusion of a special condition, if the permit is issued: 11. The applicant shall develop a plan with the Alaska Department of Transportation and Public Facilities on dust minimization, especially around subsistence areas and fish racks, prior to hauling ore from Big Hurrah Mine. *This condition was requested by EPA, and agreed to by the applicant, to minimize contact between dust generated by vehicles on the Nome Council Highway, an unpaved road, with Native-owned open-air fish drying racks.*

The applicant has proposed the use of cyanide in the recovery of gold at the Rock Creek Mine/Mill Complex because it is a more effective method of recovering gold in the float concentrate. This process has been used for over a century to recover gold. The State of Alaska and Federal regulations allow for the use of cyanide, and technological advances minimize the potential for cyanide to come into contact with the environment. The applicant's proposed process minimizes the use of cyanide and its contact with the environment. The ore is stockpiled, crushed, and ground. The crushed ore is then run through gravity and flotation circuits in the mill to get two gold concentrates. The gravity circuit would recover gold, which is 70 - 75% of the total gold that could be recovered. The remainder of the gold would be found in the flotation gold concentrate, which amounts to approximately 13% by weight of the initial ore feed. The flotation gold concentrate is mixed with lime and aerated, then mixed with cyanide in the leach circuit. As described in the Plan of Operations Volume 2 on p. 22, all cyanide solutions would be completely contained on site. The cyanide used in the mill process would be chemically neutralized prior to the placement of mill tailings into the TSF using an industry-proven method authorized by the State of Alaska. Then the tailings would be blended with the gravity and floatation tailings and placed in the TSF. All mill tailings would be contained and, upon reclamation, covered in the TSF. All liquids from the mill must also be tested and meet State standards before final discharge. There is little or no potential for the cyanide to be released into the TSF or anywhere else. In the unlikely event that the cyanide was released into the thickener it would be contained in the mill. During TSF operation, a pump back system would be used to return seepage water to the mill. The TSF would be capped, and water is excluded at abandonment. The reclamation cap and cover would further reduce the potential for tailings release. The applicant's modeling predicts that water quality from the TSF would not exceed water quality standards at abandonment or during operation. The ADEC Waste Management Plan has been approved for the TSF site and for the use of cyanide. Furthermore, cyanide would be regulated by the EPCRA because hazardous spill reports would be given to the National Response Center. If the spill occurs during cargo transport in marine waters, the U.S. Coast Guard would be the action agency and on land, the action agency would be EPA.

Due to mitigation incorporated into the project as well as Federal, state, and local requirements and conditions carried on project authorizations, the secondary impacts described above are expected to be no more than minimal.

#### Cumulative Impacts:

The proposed project, if authorized, would result in direct and secondary impacts to 346.5 acres of waters of the U.S and impacts to 422.5 acres of uplands. This could be considered a large amount of disturbance; however, in order for cumulative impact analyses to be meaningful, the analysis must be properly bounded. The proper boundary for this analysis encompasses the Nome region. Placed within this context, 240.5 acres of permanent disturbance to waters of the U.S. represents only 0.95% of the Snake River watershed alone. Virtually all drainages within the Snake River and Solomon River

watersheds have previously been extensively mined; the Corps has reviewed approximately 50 placer mining applications in the Snake River and Solomon River watersheds from 2001 through 2006. Approximately 500 acres of placer ground has been mined and reclaimed during this timeframe in these watersheds. This includes portions of the Rock Creek and Big Hurrah Creek drainages, including the proposed mine sites.

It is anticipated that, upon completion of mining and reclamation activities in Big Hurrah Creek, portions of the drainages would be restored to more natural conditions than currently exist. Upon completion of reclamation it is anticipated that willow habitat, which has been identified as higher value habitat, and wetlands would re-establish over time in portions of the area.

If exploration data within the Rock Creek mine pit is substantiated, the life of the project could be extended to 7 to 10 years, rather than 4 to 5 years. Also, the applicant controls multiple exploration targets in the Nome region, and additional resources may be discovered. Exploration will target resource areas such as the Saddle deposit, where the Company has recently compiled data that will be used to model and target both alluvial and lode gold resources on their property. Resources that may be identified through this and future exploration may extend the period of time that the Rock Creek Mill is used. Additional space in the TSF would be required to store tailings if additional facilities are processed at the mill until the TSF has been completely filled. Expanding the footprint of the TSF or construction of a new TSF may be necessary, but impacts would be the same as discussed above, likely on a smaller scale.

If future activities would involve the discharge of dredged or fill material into waters of the U.S., a DA permit would be required and the requisite analyses would be performed at that time. However, it is impossible to predict whether future projects would come to fruition as they are dependent on a wide variety of factors, including future metal prices, deposit size, fuel prices, etc.; consequently potential cumulative impacts of future operations cannot be determined.

See EID, Section 9.0 Cumulative Effects, pp. 327-332 for additional information.

## **6.2 Public Interest Review General Criteria (33 CFR 320.4(a)(2):**

### **The relative extent of the public and private need for the proposed work:**

The private need for the discharges of fill material and construction of facilities in waters of the U.S. would be for pads, mechanized land clearing, and stockpiling of organic overburden, development rock and tailings to facilitate the extraction of precious metals. In comparison, the public need would generally be to stimulate the local economy, broaden Nome's tax base, and provide for local job opportunities.

### **The practicability of using reasonable alternative locations and/or methods to accomplish the objective of the proposed structure or work:**

The Corps has determined that the applicant's preferred alternative is the least environmentally damaging practicable alternative, as explained in Section 3.5. There are no reasonable or practicable alternative methods and/or locations that would accomplish the overall purpose of the proposed action and which would be less environmentally damaging than the applicant's preferred alternative. The applicant redesigned the project through multiple meetings with the LMPT, the Corps, resource agencies, and the public to minimize impacts on the aquatic environment. There are no less environmentally damaging practicable alternatives available to the applicant that would achieve the overall project purpose. In addition, it would not be reasonable to expect the applicant to use an alternative location, as the minerals must be extracted from the location where they are discovered.

### **The extent and permanence of the beneficial and/or detrimental effects that the proposed structures or work may have on the public and private uses which the area is suited:**

The proposed work is consistent with historical use of the project area and the Nome region. The potential detrimental effect would be the permanent loss of 240.5 acres of previously disturbed habitat (in waters of the U.S.) and temporary loss of 106 acres. Wetlands are a common habitat in Alaska and the Nome region. The permanent loss of 240.5 acres of lower value wetlands in the Snake River and

Solomon River watersheds is a minimal impact due to the thousands of acres of similar undisturbed wetlands in these watersheds. In addition, impacts to the higher value willow dominated wetlands would be avoided and minimized to the maximum extent practicable. Other temporary detrimental effects would include wildlife disturbance, air quality, and traffic impacts.

The beneficial effects would include increased employment and economic stimulation in the community. The major permanent benefit that would be derived from the proposed project would be the financial returns from the applicant's investment, some of which would be infused into the local and state economies. Also, Alaska Gold Company and Native Corporation shareholders would benefit from the profits generated. Upon reclamation, the pit lakes at both sites, approximately 41 acres in surface area, would become waters of the U.S. Furthermore, the previously disturbed Big Hurrah Creek would be restored to more natural conditions suitable for aquatic organisms, habitat, and wildlife, which would benefit subsistence and recreation in the area.

### **6.3 Special Conditions and Rationale for Inclusion**

**The following conditions were included in the ADEC Certificate of Reasonable Assurance:**

1. Petrochemical and other hazardous substance spill cleanup equipment shall be available on site. Cleanup materials such as sorbent pads and drip pans shall be available and used immediately to contain and cleanup oil, fuel, hydraulic fluid, antifreeze or other pollutant spills as a result of construction activities.
2. Reasonable precautions and controls must be used to prevent incidental and accidental discharge of petroleum products. Fuel storage and handling activities for earth moving equipment must be sited and conducted so there is no petroleum contamination of surface runoff and water bodies.
3. Dredged or fill material shall be placed so that it is stable, meaning after placement the material does not show signs of excessive erosion. Indicators of excess erosion include: gullying, head cutting, caving, block slippage, material sloughing, etc. Material shall not leach harmful or toxic substances into streams or wetlands.
4. All surface runoff from areas disturbed during the stripping of overburden or moving of existing overburden piles shall be diverted to existing mine cuts or stabilized areas, such as settling ponds, using berms, diversion channels, or brush barriers. Surface runoff containing sediment from disturbed areas shall not be discharged without treatment into any water body. All soil disturbing construction operations that would increase turbidity of surface waters to levels that would violate Alaska Water Quality Standards shall be temporarily suspended if on-site monitoring demonstrates said violations.
5. During the work on the fish enhancement/material site development, construction equipment shall not be operated below the ordinary high water mark if equipment is leaking fuel, oil, hydraulic fluid, or any other hazardous material. Equipment shall be inspected on a daily basis for leaks. If leaks are found, the equipment shall not be used and pulled from service until the leak is repaired.
6. For culverts which carry waters that are discharging or will discharge into fish-bearing waters, installation shall not occur within the flowing waters of the stream. Culvert installation techniques such as stream diversion, dam and pump, or stream fluming shall be incorporated into the installation activities to ensure that silt laden water is not carried into sensitive fish habitat.
7. Any disturbance in the stream banks or streambed areas shall be stabilized to prevent erosion and resultant sedimentation of the water body during and after operations. Any disturbed areas shall be re-contoured and revegetated as soon as practicable.
8. Monitoring of the adequacy and effectiveness of Stormwater Management Best Management Practices (BMP) shall be conducted and reported with the weekly visual monitoring required in the Waste Management Permit 2003-DB0051, Section 1.8 (Monitoring). If a BMP is not working properly (such as there is sediment runoff) corrective measures shall be implemented as soon as practicable.

9. Prior to removal of new overburden and prior to placement of fill, a silt fence or similar structure shall be installed on a line parallel to and within 5 feet of the toe of slope for the overburden and spoils within all wetland areas containing standing water connected to a water body or where the toe of slope is within 25 feet of a water body. The structure shall remain in place until the fill has been fully stabilized, contained in another manner, or used for reclamation of the mine site.
10. Silt and sediment from the site excavation and fill materials may not enter wetlands or waters outside the necessary working area. Site preparation, excavation, fill placement, and construction activities must be conducted to prevent, minimize and contain the generation of silt and sediment that could be carried off-site by surface runoff. If silt and sediment are evident in standing or flowing water outside the excavation and fill area, Alaska Gold Company, or its contractors, shall apply appropriate control and containment measures. These measures may include fabric fences, straw bales, other effective filters, matting, settling ponds, or avoiding work during heavy precipitation.
11. A minimum 50 foot wide, vegetated buffer zone should be maintained between a snow storage area and any surface water bodies. This distance could be decreased if adequate stormwater/sediment catchment basins, coarse gravel berms, or sediment traps/barriers/filters are built to reduce impacts on surface water bodies from snowmelt that may potentially runoff from these sites.
12. Accumulated trash and debris need to be removed from the snow storage area in the spring as they become visible when the snow melts. This may need to be done several times over the course of the summer as the snow pile continues to melt. Wastes and litter that become uncovered as the snow melts need to be picked up before off-site migration of the waste becomes a problem.
13. Natural drainage patterns must be maintained, to the extent practicable, without introducing ponding or drying. Control of drainage must be provided by appropriate ditching, culverts, and other measures. Drainage ways must be vegetated to help control the transport of fine sediments.
14. Organic overburden soil stockpiles shall be stabilized as soon as practicable after placement to minimize erosion, sediment runoff or dust generation.
15. At permanent closure of the mill process at Rock Creek the organic overburden soil stockpiles (# 1, 2, and 3) shall be revegetated after the soil is removed for the soil cover system installed on the Tailings Storage Facility and any other reclamation required for closure.
16. Capping of the development rock dumps with topsoil/organics and revegetation, or other state approved mitigation measures, shall be required at or after mine closure on the North or South Development Dump if the water quality criteria are not met in the surface water monitoring points LNDC or LSDC or seep monitoring points described in the Monitoring Plan submitted May 31, 2006 by Alaska Gold Company, Inc. The applicant shall address this potential requirement in the updated reclamation and monitoring plans submitted in accordance with the Waste Management Permit 2003-DB0051, Section 1.12 (Permanent Closure).

In accordance with 33 U.S.C. 1341(d), all conditions of ADEC's Certification are incorporated as part of the DA permit.

The following special conditions will be included in the DA permit to ensure the project is not contrary to the public interest [33 CFR 320.4(r)], and to ensure the project complies with the 404 (b)(1) Guidelines [40 CFR 230.10(d)], or at the permittee's request.

The following special conditions will also be added to the DA permit:

1. All organic materials from excavation, fill pads and roads, development rock stockpiles, and tailings storage areas shall be removed, segregated and stockpiled for use during mine reclamation.

*Rationale: This condition was requested by USFWS and the Center for Science and Public Participation. This condition is required to facilitate reclamation of the tailing storage facility, development rock stockpiles, haul roads, water management systems, mill pad, stream corridors, and riparian areas as stated in the Reclamation Plan approved by ADNR.*

2. Any temporary or permanent standing water that will be created by project-related activities shall be tested and monitored on an ongoing basis over at least a ten year period (and longer, if needed) to determine whether toxicity/pollution levels exist that are harmful to fish, birds or other wildlife. If so, such waters shall be (1) removed immediately (if temporary), (2) treated so that toxicity/pollution is reduced to a level that no longer poses a threat to wildlife, or (3) enclosed by deterrent devices (fencing, netting, weirs, etc.) that prevent wildlife and fish from coming into contact with toxic substances or polluted water.

*Rationale: This condition was requested by USFWS. This condition is required to ensure that toxic substances or other pollutants do not enter any surface water that may be utilized by fish and wildlife [40 CFR PART 230.22].*

3. The Lindblom Creek culvert on the Glacier Creek Road shall be replaced with a culvert of sufficient size and design to accommodate the increased flows resulting from the diversion of Rock Creek-drainage surface waters above the proposed mine site. The culvert shall be designed to prevent downstream bed degradation from increased flows and allow fish passage. Increased scouring, ponding, perching of the culvert, and/or accumulation of sediment in waters of the U.S. shall be evidence of inadequate drainage and noncompliance with this condition.

*Rationale: This condition was requested by USFWS and EPA. This condition is required to ensure that a culvert of sufficient size and design is installed to maintain fish passage and minimize stream bed impacts caused by increased flow rates in Lindblom Creek as a result of diversion of Rock Creek-drainage surface waters above the mine site [40 CFR PART 230.23 and 230.24].*

4. A 50 foot vegetated buffer shall be maintained, to the extent practicable, between the active or rehabilitated Big Hurrah Creek channel and the Big Hurrah access road.

*Rationale: This condition was requested by USFWS. This condition is required to maintain the integrity and functions of the riparian buffer adjacent to Big Hurrah Creek [40 CFR PART 230.21].*

5. During Big Hurrah Creek tailings removal and channel/floodplain rehabilitation and re-contouring, the applicant shall minimize destruction of riverine tall willow vegetation. Where necessary to remove this habitat, the applicant shall salvage willows and replant or re-distribute them to increase bank or slope stability and to provide habitat for birds and shade, structure and cover for fish, including in and around newly created pools.

*Rationale: This condition was requested by USFWS and EPA. This condition is required to maximize the use of existing vegetation for stream reclamation and to simulate natural habitat for fish and wildlife [40 CFR PART 230.41].*

6. To reduce the potential for bird collisions with the proposed power line, bird diverter devices shall be installed and maintained within one quarter mile on either side of the new Glacier Creek Bridge. Diverters shall be spaced not more than 65 feet apart and alternate between outside wires. Power line poles and transmission lines also shall be designed to meet Avian Power Line Interaction Committee (APLIC) standards for reducing the likelihood of bird electrocution (<http://www.aplic.org>).

*Rationale: This condition was requested by USFWS. This condition is intended to reduce the likelihood of the impacts prohibited by the Migratory Bird Treaty Act [40 CFR PART 230.32].*

7. Within three months of permit issuance, the applicant shall meet with the Corps and USFWS to identify options for achieving additional mitigation that will benefit birds. Options may include restoration of previously degraded wetlands, purchase of or conservation easements on parcels with equivalent bird habitat values, in-lieu fees, or a combination thereof. In collaboration with the Corps and USFWS, the applicant shall develop a plan to offset the unavoidable loss of wetlands and high-value bird habitats. This plan shall include, but not be limited to, the specific actions or measures to be taken, and the deadlines for implementation or completion. The plan shall be submitted to the Corps for review and coordination with USFWS within one year of permit issuance. The Corps must provide written approval of the plan prior to implementation.

*Rationale: The condition was requested by USFWS and EPA. This condition is carried to identify other on-site mitigation opportunities that will benefit wildlife, in particular avian species [40 CFR PART 230.32].*

8. All fill and disturbed areas shall be stabilized to prevent erosion. Increased water turbidity and accumulation of sediment in drainages and adjacent wetlands shall be evidence of insufficient stabilization.

*Rationale: This condition was requested by USFWS and EPA. This condition is required to prevent sedimentation outside the permitted area [40 CFR PART 230.21 and 230.72].*

9. Project limits of authorized sites shall be clearly identified in the field (e.g., staking, flagging, silt fencing, existing footprint for maintenance activities, etc.) prior to additional clearing and construction to ensure avoidance of impacts to waters of the U.S. (including wetlands) beyond project footprints. No fill or construction materials shall be placed outside the project boundary.

*Rationale: This condition is required to prevent the placement of fill or anything that may have the effect of fill outside the permitted area; thereby, minimizing the impacts to wetlands [40 CFR PART 230.70].*

10. Natural drainage patterns shall be maintained to the maximum extent practicable. If applicable, activities must be designed to maintain preconstruction downstream flow conditions (e.g., location, capacity, and flow rates). Furthermore, activities must not restrict or impede the passage of normal or expected high flows (unless the primary purpose of the fill is to impound waters) and the structure or discharge of dredged or fill material must withstand expected high flows. Stream channelizing shall be reduced to a minimum. Activities must, to the maximum extent practicable, reduce adverse effects such as flooding, erosion, or scouring downstream and upstream of the project site. Increased scouring, ponding, perching of a culvert, and/or accumulation of sediment in waters of the U.S. shall be evidence of inadequate drainage and noncompliance with this condition.

*Rationale: This condition was requested by USFWS. This condition is required to maintain natural drainage patterns, thereby minimizing impacts to fish and wildlife [40 CFR PART 230.23].*

11. The applicant shall develop a plan with the Alaska Department of Transportation and Public Facilities on dust minimization, especially around subsistence areas and fish racks, prior to hauling ore from Big Hurrah Mine.

*Rationale: This condition was requested by EPA, and agreed to by the applicant, to minimize contact between dust generated by vehicles on the Nome Council Highway, an unpaved road, with Native-owned open-air fish drying racks.*

12. A Memorandum of Agreement between the Corps, State Historic Preservation Office, and Alaska Gold Company shall be developed. Properties at the Rock Creek Mine/Mill Complex shall be avoided. Properties at the Big Hurrah Mine Site shall be avoided or mitigated, should avoidance not be possible. The MOA shall be finalized prior to any ground disturbance at the Big Hurrah Mine site.

*Rationale: This condition was requested by the State Historic Preservation Office. This condition is required to protect historic properties that are eligible for the NRHP, pursuant to the National Historic Preservation Act and its implementing regulations at 36 CFR PART 800.6(c) and the Interim Guidance for implementing 33 CFR PART 325 Appendix C.*

The permittee shall submit an annual report for review and approval by the Corps. The report, to be submitted by December 31 of each year, shall include annotated, detailed recent aerial color photographs showing the following work, including reclamation, performed during the previous year:

- a. All mine components prominently labeled to include water management systems, development rock stockpiles, organic overburden stockpiles, mine pit boundaries, roads, mill/facility pads, etc.
- b. Location and size of areas disturbed, including areas that have been mechanically land cleared and areas where fill has been placed
- c. Location and size of areas reclaimed and ready for final inspection

*Rationale: This condition is required for monitoring and compliance to ensure that the applicant is following the DA permit, including requirements of the Reclamation Plan.*

## **7.0 Compliance with Other Federal, State, or Local Laws**

**State 401 Water Quality Certification:** Certification was issued August 9, 2006 and amended on August 18, 2006.

Pursuant to 33 CFR PART 320.4(d), the certification of compliance with applicable effluent limitations and water quality standards required under the provisions of Section 401 of the Clean Water Act are considered conclusive with respect to water quality considerations unless the Regional Administrator, U.S. Environmental Protection Agency, advises of other water quality aspects to be taken into consideration.

**Coastal Zone Management Consistency Determination:** Concurrence was provided on July 31, 2006.

**State and/or local authorizations:** ADEC Waste Management Permit, ADNR Temporary Water Use Authorizations, ADNR OHMP Fish Habitat Permit, ADNR Rock Creek and Big Hurrah Mine Project Final Reclamation Plan and Approval, ADNR OPMP Coastal Zone Consistency Determination, ADEC 401 Certificate, and ADNR Certificate of Approval to Construct a Dam.

## **8.0 Statement of Findings**

**8.1 Public Interest Determination:** I find that issuance of a Department of the Army permit, as prescribed by regulations published in 33 CFR 320 to 330:

Is not contrary to the public interest.       Is contrary to the public interest.

### **8.2 Evaluation of Compliance with 404(b)(1) Guidelines:**

#### **8.2.1 Alternatives Test (40 CFR 230.10(a)):**

Are there available, practicable alternatives having less adverse impact on the aquatic ecosystem and without other significant adverse environmental consequences that do not involve discharges into "waters of the U.S." or at other locations within these waters?

**No (See discussion in Section 3.0 above)**

If the project is in a special aquatic site and is not water dependent, has the applicant clearly demonstrated that there are no practicable alternative sites available?

**Yes (See discussion in Section 3.0 above)**

**8.2.2** Special Restrictions (40 CFR 230.10(b)). Will the discharge:

Violate state water quality standards?

**No (See discussion in Sections 6.1.3, 6.1.4 and 7.0 above)**

Violate toxic effluent standards [under Section 307] of the Clean Water Act?

**No (See discussion in Sections 6.1.17 and 7.0 above)**

Jeopardize endangered or threatened species or their critical habitat?

**No (See discussion in Section 6.1.16 above)**

Violate standards set by the Department of Commerce to protect marine sanctuaries?

**No (See discussion in Section 6.1.23 above)**

**8.2.3** Other restrictions (40 CFR 230.10(c)): Will the discharge contribute to significant degradation of "waters of the U.S." through adverse impacts to:

Human health or welfare, through pollution of municipal water supplies, fish, shellfish, wildlife and/or special aquatic sites?

**No (See discussion in Sections 6.1.12, 6.1.13, 6.1.15, and 6.1.18 above)**

Life stages of aquatic life and/or wildlife?

**No (See discussion in Section 6.1.13 and 6.1.15 above)**

Diversity, productivity, and stability of the aquatic life and other wildlife? Or wildlife habitat or loss of the capacity of wetlands to assimilate nutrients, purify water or reduce wave energy?

**No (See discussion in Section 6.1.4, 6.1.7, 6.1.9, 6.1.10, 6.1.13, 6.1.15 above)**

Recreational, aesthetic, and/or economic values?

**No (See discussion in Section 6.1.21, 6.1.22, and 6.1.32 above)**

**8.2.4** Actions to minimize potential adverse impacts [mitigation](40 CFR 230.10(d)). Will all appropriate and practicable steps [40 CFR 230.70-77] be taken to minimize adverse impacts of the discharge on the aquatic ecosystem?

**Yes (See discussion in Sections 4.0 and 6.3 above)**

**8.3 Findings of Compliance or Non-compliance with the 404(b)(1) Guidelines** (40 CFR 230.12):

The discharge complies with the guidelines, with the inclusion of the appropriate and practicable conditions listed above to minimize pollution or adverse effects to the affected ecosystem.

**8.4 Request for public hearing:** None were received; however, a Public Meeting was held jointly with the ADNR on June 26, 2006 in Nome, Alaska.

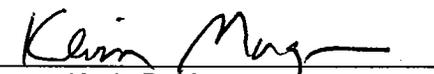
**8.5 Section 176(c) of the Clean Air Act General Conformity Rule Review:** The proposed project has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. It has been determined the activities proposed under this permit will not exceed *de minimis* levels of direct emissions of a criteria pollutant or its precursors and are exempted by 40 CFR PART 93.153. This no-effect determination has been coordinated with the U.S. EPA and the ADEC. Any later indirect emissions are generally not within the Corps continuing program responsibility and generally

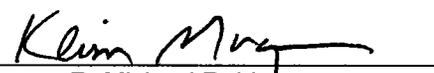
cannot be practicably controlled by the Corps. For these reasons, a conformity determination is not required for this individual permit.

**8.6 Finding of No Significant Impact (FONSI) (40 CFR 1508.13):** Having reviewed the information provided by the applicant, all interested parties and the assessment of environmental impacts contained in Section 6.0 of this document, I find that this permit action will not have a significant impact on the quality of the human environment. Therefore, an Environmental Impact Statement is not required.

Prepared by: Julie A. Woodke, Regulatory Specialist  
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Reviewed by:  23 Feb 07  
Steve Meyers Date  
Chief, North Section  
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Concurred by:  23 Feb 07  
Kevin D. Morgan Date  
Deputy Chief, Regulatory Division

Recommended by:  23 Feb 07  
~~Fok~~ R. Michael Rabbe Date  
Chief, Regulatory Division

Approved by:  26 Feb 07  
Kevin J. Wilson Date  
Colonel, Corps of Engineers  
District Commander

## ACRONYMS USED

ACMP:	Alaska Coastal Management Program
ADEC:	Alaska Department of Environmental Conservation
ADNR:	Alaska Department of Natural Resources
APLIC:	Avian Power Line Interaction Committee
Act:	Endangered Species Act
BATFE:	Bureau of Alcohol, Tobacco, Firearms, and Explosives
BMP:	Best Management Practices
CFR:	Code of Federal Regulations
Corps:	United States Army Corps of Engineers
cy:	Cubic yards
DA:	Department of the Army
DC:	District Commander
EA:	Environmental Assessment
EFH:	Essential Fish Habitat
EID:	Environmental Information Document
EIS:	Environmental Impact Statement
EPA:	United States Environmental Protection Agency
EPCRA:	Emergency Planning and Community Right-to-Know Act
FONSI:	Finding of No Significant Impact
HDR:	HDR Alaska, Inc.
kV:	kilovolt
LMPT:	Large Mine Permitting Team
MOA:	Memorandum of Agreement
MSGP:	Multi-Sector General Permit
MSHA:	Mine Safety and Health Administration
N/A:	Not applicable
NAG:	Non-acid generating
NEPA:	National Environmental Policy Act
NMFS:	National Marine Fisheries Service
NPDES:	National Pollutant Discharge Elimination System
NRHP:	National Register of Historic Places
OHMP:	Office of Habitat Management and Permitting
OPMP:	Office of Project Management and Permitting
PAG:	Potentially acid generating
SHPO:	State Historic Preservation Officer
SWPPP:	Stormwater Pollution Prevention Plan
TSF:	Tailings Storage Facility
Trustees:	Trustees for Alaska
U.S.:	United States
USACE:	United States Army Corps of Engineers
USDOT:	United States Department of Transportation
USFWS:	United States Fish and Wildlife Service

## PROJECT COMPONENT DEFINITIONS

Rock Creek Mine Project:	The entire project, which would consist of both the Rock Creek Mine/Mill Complex and the Big Hurrah Mine, see Section 2.1.2 Project Description
Rock Creek Mine/Mill Complex:	Mine, Mill and associated facilities in Rock Creek drainage, see Section 2.1.2 Project Description
Big Hurrah Mine:	Mine and associated facilities in Big Hurrah drainage, see Section 2.1.2 Project Description