

Responses to Comments on Draft Authorizations for the Rock Creek Mine

August 9, 2006

INTRODUCTION

This document contains a synopsis of the comments that were received orally at the public hearing held in Nome on June 26, 2006 and in writing during the public notice period from June 29, 2006 through July 6, 2006 along with responses to those comments. The comments and responses are grouped into major subject areas.

The responses in this document were used to finalize state decisions and permits. This document is a joint response from the following agencies:

- Alaska Dept. of Natural Resources, Office of Project Management & Permitting
- Alaska Dept. of Natural Resources, Office of Habitat Management & Permitting
- Alaska Dept. of Natural Resources, Division of Mining, Land, and Water
- Alaska Dept. of Environmental Conservation, Division of Water

PROJECT DESCRIPTION

The Rock Creek Project is located on the Seward Peninsula along the west coast of Alaska. There are two project components: the Rock Creek Mine/Mill Complex located about 6 miles north of Nome in the Snake River watershed, and the Big Hurrah Mine located about 42 miles east of Nome in the Solomon River watershed. Both are proposed to be developed as open pit gold mines by the project applicant, Alaska Gold Company (AGC), a wholly owned subsidiary of NovaGold Resources, Inc.

The known gold resource at the Rock Creek Mine/Mill Complex lies within land owned approximately 66 percent by AGC, with the remainder within Bering Straits Native Corporation (BSNC) lands. At Big Hurrah site, the known gold resource lies within land owned 100 percent by AGC, and the surrounding lands are owned by Solomon Native Corporation.

The Rock Creek Mine/Mill Complex as planned includes an open pit mine, two non-acid-generating development rock stockpiles, a gold recovery plant, and a paste tailings storage facility. Standard drilling and blasting techniques would be used to break the ore. Ore milling rates would be about 2.75 million tons/year, while development rock stripping volumes would be in the range of 4.4 to 5.5 million tons/year. Milling would include crushing, screening, gravity separation, flotation, and a cyanide leaching process. The expected mine life is 4.5 years, with potential for additional discovery and expansion. The project would employ up to 135 employees.

The Big Hurrah component consists of a smaller open pit gold mine, a non-acid-generating development rock stockpile, a temporary stockpile for acid-generating development rock that would later be backfilled into the pit, and an ore stockpile. Ore would be trucked to the Rock Creek Mine/Mill Complex to be milled. Ore would be mined at a 1,500 tons/day rate on a seasonal basis for a total of approximately 270,000 tons/year for 4 years.

The Alaska Department of Natural Resources (ADNR) has prepared a Reclamation Plan Approval, six Temporary Water Use Permits and a Title 41 Fish Habitat permit. ADNR also conducted a review of the proposed project for consistency with the Alaska Coastal Management Program (ACMP).

The Alaska Department of Environmental Conservation (ADEC), Division of Water has prepared a Waste Management Permit (2003-DB0051) for disposal of treated wastewater, tailings and other solid wastes at the Rock Creek site; and disposal of treated wastewater and other solid wastes at the Big Hurrah site. ADEC also anticipates that it will issue a Certificate of Reasonable Assurance of the Army Corps of Engineers Section 404 Permit.

SUMMARY OF PUBLIC COMMENTS

Thirteen letters were received in support of the project. These letters pointed out the economic benefits of the project to individuals through employment and business opportunities, as well as to the City of Nome from new sales tax revenue generated by the sale of electricity to AGC. They also spoke to Alaska Gold's demonstrated commitment to improving the environment and the respect they have shown to the subsistence, cultural and traditional resources of the people living in the region. The Kawerak, Inc. Education, Employment and Training Division referenced the apprenticeship programs for regional residents they have worked on with Nova Gold Administrators. They commended NovaGold for their willingness to train and hire within the region, and for their publicly expressed goals to train and support the work force they get in order to move them beyond entrance level jobs.

The following groups provided letters supporting the project:

- City of Nome
- Wales Native Corporation
- Brevig Mission Native Corporation
- Nome Chamber of Commerce
- Bering Straits Native Corporation
- Sivuqaq Inc.
- Resource Development Council
- Alaska Miners Association, Inc.
- Bering Straits Development Council

Twenty-five form letter faxes were received from vendors and contractors for the Rock Creek Project voicing support for this Alaska-based company promoting economic development for Alaskans. These businesses cited the anticipated boost to Nome's economy, Alaska Gold's demonstrated preference to local and Alaskan businesses, their strong support from Native communities in the Nome area, and the company's commitment to maintaining and improving the environment.

We received fourteen letters that expressed concern about specific issues related to the Rock Creek Project.

During oral testimony taken in a public hearing in Nome on June 26, 2006, 19 people voiced support of the project. Testifiers included representatives from Bering Straits Native Corporation, White Mountain Native Corporation, Sitnasuk Native Corporation, and the City of Nome. Reasons cited in support of the project included possible development of adjacent native corporation lands, Alaska Gold's demonstrated commitment to local hire, their training of emergency responders and support of community organizations, and how Alaska Gold has cleaned up a lot of messes left by their predecessors.

The issues of concern expressed during oral testimony were very similar to those received in writing. The sections below summarize, by topic, the oral and written comments; following each comment summary is the joint State response to those comments.

PROCEDURAL COMMENTS

1. **Comment:** Conditions contained in operational plans must be explicitly stated in the draft permit and any permit modifications must be made available for public notice and comment. Approval of plans allowing changes to any of the operations at Rock Creek or Big Hurrah Mines clearly could cause “detrimental environmental impacts,” thus triggering the issuance of a new permit or modification of the permit with the corresponding public notice and comment under 18 AAC 15.100.

Response: Any proposed changes to the permit, proposed changes to ADEC approved plans associated with the final permit or submission of plans required by the final permit for ADEC approval will be reviewed to determine whether the expansion, modification, or other change in a facility process or operation may result in an increase in emissions or discharges, or might cause other detrimental environmental impacts in accordance with 18 AAC 15.100(c). If the Department finds that the proposed changes would result in an increase in emissions or discharges, or might cause other detrimental environmental impacts a public notice of the proposed changes will be provided in accordance with 18 AAC 15.050. If the Department finds that the proposed changes would not result in an increase in emissions or discharges, or would not cause other detrimental environmental impacts it will be treated as a permit amendment and a public notice of the proposed changes would not be required, as allowed in 18 AAC 15.100(d). Section 1.2.12 of the final waste management permit has been updated to reference the procedures contained in 18 AAC 15.100 in the event that proposed changes to the permit or approved plans occur.

2. **Comment:** In general it appears that the proposed plan is not consistent with 11 AAC 112.900. Sequencing processes to avoid, minimize, or mitigate.

Response: Comments relating to 11 AAC 112.900 are addressed in the Alaska Coastal Management Program’s Final Consistency Response dated July 31, 2006.

3. **Comment:** Both the EPA Technical Report, EPA530-R-94-037, NTISPB94-201837, Treatment of Cyanide Heap Leaches and Tailings, September 1994 and the International Cyanide Management Code make references and suggestions for disposal and treatment that should guide monitoring and reclamation of the Rock Creek mine.

Response: We are familiar with both of these documents and, where appropriate, used the information and recommendations contained therein during our evaluation of the Rock Creek Project.

4. **Comment:** The additional time for comment on the DNR and DEC permits is welcome but woefully inadequate to address environmental impacts from the Rock Creek project

Response: AS 46.03.110(b) allows any person to submit written comments on a waste disposal permit application to the ADEC within 30 days after the first publication of the public notice. The comment period timeframe for review of the Rock Creek waste disposal permit application, and draft permit, was extended to 36 days. All statutory requirements for public notice of the Rock Creek waste disposal permit application and the ADNR reclamation plan approval was met.

WETLANDS

1. **Comment: The State cannot certify that a 404 permit in this case will comply with the Clean Water Act or Alaska water quality standards because (1) significant wetlands will be “disturbed” and ultimately destroyed, and (2) the elimination of those wetlands will not comply with antidegradation requirements.**

Response: The Rock Creek Mine/Mill Complex has been designed to minimize the overall footprint of the facility and to avoid wetlands where possible. The impacted area is a small percentage of the entire Snake River watershed. The mine itself is in an area previously impacted by placer mining. The project had the overall goal of avoiding wetlands all together. The development rock stockpiles were relocated during the final design to minimize the wetlands impacts during construction and operation. The design focused on minimizing disturbance to higher value willow wetlands by moving the stockpiles into the lower value open tundra wetlands. Organic material will be stockpiled for use in reclamation at the end of the project. The access road into the Big Hurrah Mine is being designed in coordination with the Alaska Department of Natural Resources, Office of Habitat Management and Permitting, not only to locate the road to where it least impacts the stream, but also to incorporate fishery enhancement components into the construction project. The project was found to be consistent with the antidegradation policy.

We acknowledge DEC is still working on implementation guidance for its antidegradation policy. The policy is clearly spelled out in 18 AAC 70.015 and can be used on a site-specific basis. With the absence of implementation guidance, staff has to use best professional judgment to make their decisions.

For further responses on wetlands-related comments, please see the U.S. Army Corps of Engineers 404 Permit and accompanying documents.

TRANSPORTATION

1. **Comment: Dust kicked up by the big trucks will contaminate the fish and meat on drying racks along the route.**

Response: The Alaska Dept. of Transportation & Public Facilities currently performs dust control measures on three sections of the road to Big Hurrah. ADOT&PF sometimes does this themselves and sometimes they use a contractor, such as Kawerak, Inc. If a member of the public feels that too much dust is being generated, they may ask the company to take voluntarily action or ask ADOT&PF to post a lower speed limit. Voluntary action could include such things as watering the road, applying a dust suppressant, or driving at a lower speed through a certain section of road. AGC has stated that it is willing to work with ADOT&PF on dust control.

2. **Comment: The constant truck traffic will tear up the roads at an accelerated rate. The state of Alaska should require a bond to repair damage to the coastal road that may result with the increased loads.**

Response: The Alaska Dept. of Transportation & Public Facilities commonly imposes load restrictions and speed limits for the purpose of preserving roads. Alaska Gold Company must use legal-sized trucks and loads and must abide by all other commercial trucking requirements. If ADOT&PF finds that excessive damage is occurring to the road they can impose tighter restrictions;

however, they cannot restrict traffic on public roads if those vehicles are operated in compliance with the law. ADOT&PF has a policy that allows them to establish a memorandum of understanding with a private party to provide maintenance above and beyond that which is provided by ADOT&PF. It is in the best interests of the company to keep the road in a safe, drivable condition. AGC has stated that it is willing to work with ADOT&PF on maintenance issues.

3. Comment: The most immediate issue is one of safety relating to people on bicycles, children, school buses, and travel during foggy conditions, etc.

Response: ADOT&PF commonly imposes speed limits for public safety reasons. Alaska Gold Company must obey these speed limits. If a member of the public feels that the speed limit is too high, they may ask the company to voluntarily drive at a lower speed through a certain section of road or they may ask ADOT&PF to post a lower speed limit.

ARD/METALLURGY

1. Comment: The State received a number of comments regarding the appropriateness of the methods that were used to evaluate the acid generation and neutralization potential of the development rock at both the Rock Creek and the Big Hurrah Sites:

- a. Assuming all of the neutralizing potential of the rock samples, especially the non-carbonate NP, is not appropriate in considering bulk rock NP/AP ratios.
- b. Why do the siderite-corrected and TIC-corrected values show less potentially acid generating material than for the uncorrected Sobek method? Why was the siderite-corrected NP chosen over the more conservative combined siderite- TIC corrected NP?
- c. Iron carbonate minerals were reported as observed within the Big Hurrah samples however siderite effervesces slightly in contact with strong acids or with warm acids, and likely does not have much Neutralizing Potential (NP).
- d. It does not appear that the plan adequately determined the neutralizing potential of rock materials and mentioned the alternative methods but it is unclear how the different testing methods were coordinated.
- e. It appears the project plan's acid generating potential (AGP) tests may be deficient in predicting the AGP of Big Hurrah Creek and Rock Creek.

Response: The evaluation of the geochemistry of an ore deposit is an iterative process. The company originally conducted static tests to evaluate the acid generating potential of the development rock using a method of Acid Base Accounting (ABA) known as the Standard Sobek Method. This method can overestimate the neutralization potential due to the presence of non-carbonate minerals that dissolve during the test and yields results that should be considered the “maximum theoretically possible” neutralization potential. Moreover, the presence of iron carbonate minerals (for example siderite) can contribute to the measured inorganic carbonate measurement without a commensurate contribution to neutralization potential. To evaluate the amount of “available” neutralization potential that would be anticipated in the field, the State required the company to conduct an additional round of sampling and ABA Test Work where the neutralization potential for each sample was evaluated using the Standard Sobek Method, the Modified Sobek Method with a Siderite Correction, and the Total Inorganic Carbon (TIC) Method. The use of the Modified Sobek Method with the Siderite Correction allowed a determination of how much of the neutralization potential indicated by the Standard Sobek Method was in fact due to iron carbonates and that should be discounted in the assessment of the actual neutralization potential of the rock. In a similar manner the Total Inorganic Carbon Test was conducted to determine how much of the neutralization potential indicated by the

Standard Sobek Method was in fact due to non-carbonate minerals. The neutralization potential of non-carbonate minerals may or may not be actually available due to the slow rates of dissolution of these minerals compared to the rate at which carbonates dissolve and neutralize acid produced by the oxidation of the sulfide minerals.

At the Rock Creek Site approximately 8 percent of the carbonate minerals are iron carbonates and approximately 12 percent of the potential neutralization potential indicated by the Standard Sobek Method appears to be due to non-carbonate minerals. These factors were taken into consideration when the State evaluated the overall potential for the development rock dumps to generate acid and determined that the proposed blending of waste rock at the Rock Creek Site could reasonably be expected to remain pH neutral and is not anticipated to result in water quality exceedances due to runoff or seepage from the dumps. Development rock characterization and water quality monitoring will be conducted during mine operation to confirm these predictions. The State hired Jay McNee, PhD, from Lorax Environmental, as a consultant to review the geochemical characterization work submitted by the applicant. Mr. McNee agreed with the applicant's assessment that it is reasonable to assume that the development rock dump at Rock Creek will be overall non-acid generating if the development rock is managed as proposed by the applicant. The Rock Creek Monitoring Plan contains surface water monitoring in the diversion ditches down-gradient of both development rock stockpiles at Rock Creek to ensure that any potential for acid rock drainage and/or metals leaching is detected and corrective actions can be implemented if needed and operational geochemical testing of the development rock material will be required to confirm the current geochemical characterization.

At the Big Hurrah Site approximately 15 percent of the carbonate minerals are iron carbonates and approximately 24 percent of the neutralization potential indicated by the Standard Sobek Method appears to be due to non-carbonate minerals. These factors were taken into consideration when the State evaluated the overall potential for the development rock dump to generate acid and determined that the originally proposed blending of waste rock at the Big Hurrah Site could reasonably be expected to result in water quality exceedances due to runoff or seepage from the dumps. The State required that Alaska Gold Company develop an alternative development rock handling and closure plan for the Big Hurrah Site. The company has proposed to conduct operational characterization and segregation of the development rock and to place PAG material in a separate stockpile that would be backfilled into the pit and submerged when the pit fills with water. The State has not approved the company's plan for the characterization and handling of development rock at the Big Hurrah Site. Additional geochemical characterization is being required to better define the neutralizing potential of the non-carbonate minerals in the development rock.

A detailed discussion of the geochemistry performed to date at Rock Creek and Big Hurrah can be found in the Plan of Operations – Volume 8 – Geochemistry and Groundwater Reports.

2. **Comment:** The State received a number of comments that were concerned with the development rock characterization, handling and closure at the Big Hurrah Site:
 - a. How will the adopted NP/AP ratios minimize the risk of the temporary storage area and blended development rock dump from producing ARD and thereby reduce the likelihood of downstream water quality violations?
 - b. The geochemical characterization and management of PAG development rock at the Big Hurrah Mine is also a concern for water quality. Currently, questions regarding AGC's plans for the blending and temporary storage of PAG development rock at Big Hurrah are unresolved and have not been incorporated into the Draft Permit.
 - c. The conclusion that acid rock drainage will not be a problem at the sites is an oversimplification related to the conclusion that the waste dump material is "... overall non acid-generating..."

- d. **Potentially acid generating (PAG) material is to be stockpiled for later combination with non-acid generating (NAG) material but there is a lack of information as to how the combination will take place in the field.**
- e. **The plan's combination of neutralizing material with acid generating material at Big Hurrah Creek must be altered to reflect the inability of Big Hurrah Creek material to act as a buffer and the plan can not be approved as designed for it lacks sufficient planning and computation of neutralizing material.**
- f. **Why is blending preferable to isolation as a waste management technique?**

Response: The State has not approved the currently submitted plans for the characterization and handling of development rock at the Big Hurrah Site. Prior to applying for approval to mine at the Big Hurrah Site, the company must conduct additional geochemical testing to determine how much of the non-carbonate neutralization potential indicated by the Standard Sobek Test Method is actually readily available and can be expected to provide neutralization in the field. This test program must be approved by the State. The company will use the results to modify their original waste rock characterization and handling plan. This will require State review and approval prior to mining at the Big Hurrah Site.

Waste Management Permit Section 1.7.1.2 requires that the permittee, prior to storage or disposal of development rock at Big Hurrah, develop a PAG rock handling plan that ensures development rock is adequately characterized and handled to minimize the amount of PAG development rock that is placed in the blended “non-PAG” development rock dump at Big Hurrah and that the PAG is managed in a manner that protects water quality.

Waste Management Permit Section 1.7.1.2.2 requires that the permittee, prior to storage or disposal of development rock at Big Hurrah, develop a PAG rock handling plan that ensures runoff water from the temporary storage stockpile does not reach waters of the State. The PAG temporary storage stockpile is designed such that potential acid mine drainage from the PAG stockpile at Big Hurrah is directed towards the mine pit. All water that accumulates in the pit will be collected and treated to meet all applicable state and federal standards prior to injection into the groundwater system.

The ADNR Reclamation Plan Approval contains numerous specific requirements regarding additional geochemical characterization, operational segregation and handling, and closure of both the PAG and non-PAG development rock at the Big Hurrah Site. These are:

- Adequate geochemical characterization of the development rock to determine the PAG NP/AP cutoff ratio that minimizes the risk of the blended non-PAG development rock dump creating water quality exceedances and that allows for the maximum amount of PAG development rock to be backfilled into the pit at closure with adequate water cover to minimize potential acid production;
- The permittee shall receive ADNR approval prior to implementation of the geochemical characterization plan referenced above;
- The PAG NP/AP cutoff ratio shall not be less than 1:1. The ADNR will evaluate the results of the operational geochemical characterization and waste rock handling program and may require periodic changes to the PAG NP/AP cutoff ratio;

- An operational development rock characterization and handling plan that is approved by ADNR. The operational development rock characterization and handling plan shall ensure that development rock is adequately characterized and handled to:
 - Minimize the amount of non-PAG rock reporting to the temporary PAG stockpile;
 - Minimize the amount PAG development rock that is placed in the blended non-PAG development rock dump;
 - Ensure that the non-PAG dump is sufficiently blended such that “hot spots” of acid generation do not occur within the facility;
 - Ensure that PAG development rock is temporarily stored, prior to disposal at mine closure, such that run-on water is minimized and runoff water does not reach waters of the State;
 - Maintain separate stockpiles for PAG and non-PAG development rock or describe sampling and test procedures that would be used during the excavation of the PAG development rock during pit backfilling activities.

- An update to the predicted quantities of PAG development rock that will result from the mining of the Big Hurrah Pits, the available pit volume below the anticipated pit lake elevation at the end of the planned mine life, and an assessment of the geochemical characteristics of the residual blended dump (non-PAG dump) once the PAG rock that will be backfilled into the pit is removed from the waste rock stream placed in the non-PAG dump.

- The permittee shall not place PAG development rock in the development rock stockpiles at Big Hurrah Mine or as backfill in the satellite pit (unless specifically authorized by the ADNR). During operations the permittee shall sample, characterize, segregate and store the PAG development rock in a location and manner approved by ADNR. At closure the PAG development rock shall be submerged below the water table in the pit at Big Hurrah, in manner to allow for adequate water cover to prevent acid generation from the PAG development rock, unless Alaska Gold Company is specifically authorized to blend PAG material with non-PAG development rock. The backfilling and submergence of the PAG development rock shall be completed within 16 months of the completion of mining at the Big Hurrah Site, unless otherwise authorized by ADNR.

- Prior to initiation of reclamation of the development rock dumps, Alaska Gold Company shall submit to ADNR final facility closure plans and schedule for review and approval. The final facility closure plans shall include consideration of water quality monitoring data, waste rock characterization records, development rock geochemical monitoring results and the results of the required environmental audit. Exceedances of water quality from the non-PAG development rock dump are not expected. However, if seepage or runoff from the non-PAG development rock dump exceeds water quality standards, ADNR may require the reclamation of these facilities to minimize infiltration and/or impacts from runoff and may require covers to include a low-permeability layer, growth medium replacement, seed / fertilizer application and also surface flow diversion ditches. The final facility closure plan should also include backfill plans for the PAG rock stockpile.

The management of the PAG development rock will involve placement of this material back into the pit for submergence when the pit fills with water. The NP/AP Cut-Off Ratio will be used to determine whether development rock removed from the pit is placed in the temporary PAG Stockpile or is placed in the non-PAG or “blended” development rock dump. This ratio must be set to allow for the placement of a maximum amount of PAG rock back into the pit while ensuring that any additional

PAG material that is blended into the non-PAG Dump during mining of the pits will not result in a final non-PAG development rock dump that could result in exceedances of water quality standards due to either runoff or seepage from the dump.

Jay McNee, PhD, from Lorax Environmental, consultant to the state, reviewed the geochemical characterization work submitted by the applicant. Dr. McNee concluded that the removal and submergence of sufficient PAG material could allow the remaining material suitable for blending, particularly if convincing evidence of the availability of non-carbonate neutralization potential can be demonstrated. If it can be demonstrated that blending will result in an overall non-PAG waste rock dump, this is expected to provide appropriate protection of the down-gradient environment while reducing operational and closure costs and also long-term environmental risks associated with the isolation of PAG material.

3. **Comment: A number of comments were directed specifically towards the management of waste required by the ADEC Waste Management Permit:**
- a. **Section 1.1.4 contains no definition of PAG.**
 - b. **Arsenic and Antimony which were shown to have been released immediately from the HCT's is also a cause of concern as both are toxic and the poisonous response in biological life is similar.**
 - c. **It does not appear that Big Hurrah post closure tests will be performed frequently enough and operational tests will be emphasized over post operational tests.**
 - d. **The regulators need to continually focus on how this rock is being managed, and require frequent and well-considered monitoring during mining, as well as post-mining. A long-term remediation fund should be established for management of water quality impacts from the mine.**
 - e. **There is no information characterizing the flow regime of Big Hurrah Creek and it must be determined if blending will ensure buffering of acid mine drainage. The plan to address potential acid generation at Big Hurrah may be highly flawed.**
 - f. **Containment of drainage resulting from the temporarily stored PAG development rock may result in violations of water quality standards.**

Response: Waste Management Permit Section 1.1.4 states that the permittee can dispose of wastes "as specified in this permit". Waste Management Permit sections 1.1.5 and 1.7 have been updated and require that the permittee implement a geochemical characterization plan to determine the PAG cutoff ratio (the cutoff ratio defines the cutoff between PAG and non-PAG development rock), and seek ADEC approval of both the development rock characterization plan and the PAG cutoff ratio, prior to disposal or storage of development rock at Big Hurrah. This requirement prohibits the disposal of any development rock at Big Hurrah prior to ADEC approval since there is currently no ADEC approved development rock characterization plan in place. As stated earlier in this comment response, the ADEC will review any proposed changes in operations and/or requests for approval and determine if a public notice is required in accordance with 18 AAC 15.100.

The Waste Management Permit has requirements that address seepage of antimony and arsenic (in addition to all parameters that are regulated as pollutants) from the tailings storage facility (TSF). During operations the TSF is designed to operate as a zero discharge facility. Waste Management Permit Section 1.4.1 requires that the TSF be operated as a zero discharge facility. The facility monitoring plan (required by Section 1.8.1) contains monitoring of wells and surface waters down-gradient of the TSF to ensure that water quality criteria are being met. The State's third-party environmental consultant, Jay McNee, agreed with the applicant's assessment that it is reasonable to assume that the development rock dump at Rock Creek could be considered overall non-acid generating and that it was reasonable to assume that metal leaching will not occur if the development

rock is managed as proposed by the applicant. The Rock Creek Monitoring Plan contains surface water monitoring in the diversion ditches down-gradient of both development rock stockpiles at Rock Creek and geochemical testing of the development rock material to ensure that any potential for acid rock drainage and/or metals leaching is detected and corrective actions can be implemented if needed. Waste Management Permit Section 1.7.1.2 requires that the permittee, prior to storage or disposal of development rock at Big Hurrah, develop a PAG rock handling plan that ensures development rock is adequately characterized and handled to minimize the amount of PAG development rock that is placed in the blended “non-PAG” development rock dump at Big Hurrah and that the PAG is managed in a manner that protects water quality.

The long term post closure monitoring schedule is consistent with what has been approved at other mines in Alaska. The long term post closure monitoring schedule can be adjusted as allowed in Waste Management Permit Section 1.12.6, which states: “Post-closure monitoring of the groundwater and visual monitoring for settlement and erosion shall occur according to the sampling schedule set out in the current Monitoring Plan approved by the Department. This schedule and the parameters monitored may be modified by the Department based on the monitoring results received.”

The primary focus of the Waste Management Permit is the management of tailings and potentially acid generating (PAG) development rock. Permit Section 1.8 requires that the permittee implement an ADEC approved monitoring plan during operations. Permit Section 1.13 requires that the permittee post financial responsibility (bond) for closure and post-closure monitoring of the facilities. The bond will cover the costs of 30 years of post-closure monitoring and one-time treatment of water in the tailings impoundment. Based on the information submitted to date, the State does not believe that recurrent or long-term water treatment will be required. However, during operations water quality and geochemical monitoring analyses will be reviewed to ensure that the long term water quality predictions submitted during permit application are accurate. If the state believes that water quality standards may be exceeded post-closure, at either site, that bond amount will be adjusted accordingly.

Waste Management Permit Section 1.7.1.2.2 requires that the permittee, prior to storage or disposal of development rock at Big Hurrah, develop a PAG rock handling plan that ensures runoff water from the temporary storage stockpile does not reach waters of the State. The PAG temporary storage stockpile is designed such that potential acid mine drainage from the PAG stockpile at Big Hurrah is directed towards the mine pit. All water that accumulates in the pit will be collected and treated to meet all applicable state and federal standards then injected into the groundwater system. The ADNR Reclamation Plan requires additional geochemical evaluation to determine the available neutralization potential in the waste rock at the Big Hurrah Site, revised operational characterization and handling plans, and the submittal of final facility closure plans for review and approval.

4. Comment: The State received a number of comments that could be considered general comments on the adequacy of the geochemical evaluation program and water quality data. The responses for these comments will immediately follow the comment:

- a. The HCT's were not conducted properly and may have sat for one year or more before first flush.**

Response: Jay McNee, PhD, from Lorax Environmental, reviewed the geochemical characterization work submitted by the applicant. After review Mr. McNee determined that appropriate methods were utilized in the HCT's.

- b. Data for elements alphabetically above N (Pb, Sb, Se, Tl, Zn) appear to be missing from both Tables 6a and 6b.**

Response: Alaska Gold Company responded to this comment by adding the missing data to those tables and reissuing the memo whose subject is “Rock Creek Project – Preliminary Materials Geochemical Testing Update” dated March 27, 2006.

- c. **Is the drill hole location information presented in Figure 1 correct (for the Rock Creek Site)? A significant number of the ABA samples depicted in this figure appear to be outside the pit and wall rock area. If this is correct, there could be bias in the data. Given the locations in this figure, any bias would likely be toward the non-acid generating end of the data spectrum.**

Response: Alaska Gold Company confirmed that the drillhole locations presented in Figure 1 are accurate. At Rock Creek, ore is slightly more acid generating than the development rock. However, even at Rock Creek the ore on average is not considered to be acid generating, so even if one assumed that all the waste, both within and outside of the proposed pit, had the same ABA as the ore, acid generation from the blended development rock dumps is not considered likely. Operational development rock characterization at the Rock Creek Site will be required to confirm the current geochemical assessment. A final facility closure plan must be developed that considers operational geochemical characterization records and water quality monitoring data.

- d. **Sampling framework is not characterized very well within the project documents and so the precision of Acid Generating Potential (AGP) studies can not be determined from plan documents.**

Response: Mr. McNee determined that the work was sufficient and that the appropriate methods were utilized. A detailed discussion of the geochemistry analyses performed to date at Rock Creek and Big Hurrah can be found in the Plan of Operations – Volume 8 – Geochemistry and Groundwater Reports.

WASTE MANAGEMENT – SOLID WASTE

1. **Comment: The draft permit does not contain any permit conditions that explain how wildlife will be deterred from accessing solid waste disposal areas at the Rock Creek or Big Hurrah Mines.**

Response: Waste Management Permit Section 1.4.16 has been updated as follows: “The permittee shall implement hazing or other effective measures as necessary to ensure that any waste disposal area or area of open water in the mine area does not attract wildlife. Any wildlife casualties shall be reported to the Department and to the appropriate state and federal agencies.” Waste Management Permit Section 1.4.16, and 18 AAC 60.010, allows the ADEC discretion to determine what an attractive area and/or effective measures are.

2. **Comment: The draft permit does not adequately protect against the production of polluted runoff from waste storage facilities.**

Response: During operations the tailings storage facility (TSF) is designed to operate as a zero discharge facility. Waste Management Permit Section 1.4.1 requires that the TSF be operated as a zero discharge facility. The facility monitoring plan (required by Section 1.8.1) includes monitoring

of wells and surface waters down-gradient of the TSF to ensure that water quality criteria are being met. Waste Management Permit Section 1.7.1.2.2 requires that the permittee, prior to storage or disposal of development rock at Big Hurrah, develop a PAG rock handling plan that ensures runoff water from the temporary storage stockpile does not reach waters of the State. The PAG temporary storage stockpile is designed such that potential acid mine drainage from the PAG stockpile at Big Hurrah is directed towards the mine pit. All water that accumulates in the pit will be collected and treated to meet all applicable state and federal standards prior to injection into the groundwater system. The facility monitoring plan (required by Section 1.8.1.8) includes monitoring of wells and surface waters down-gradient of the PAG stockpile at Big Hurrah. Waste Management Permit Section 1.6 regulates the injection of treated wastewater from the facilities. The effluent limits contained in Section 1.6 were calculated based on the applicable water quality criteria. During operations, the permit allows only treated pit dewatering water and storm water that falls on the pit area to be disposed of via injection.

The development rock stockpiles at Rock Creek are not considered a waste as defined by 18 AAC 60.005(c)(8) since information submitted during the permit application process indicates that there will be no environmental problem associated with management of the development rock at Rock Creek. However, the Rock Creek Monitoring Plan contains surface water monitoring in the diversion ditches down-gradient of both development rock stockpiles at Rock Creek and geochemical testing of the development rock material to ensure that any potential for acid rock drainage and/or metals leaching is detected and corrective actions can be implemented if detected.

Storm water discharges are regulated under the Environmental Protection Agency (EPA) National Pollution Discharge Elimination System (NPDES) program through coverage under general permits. During construction of the mines Alaska Gold Company is required to develop and implement Storm Water Pollution Prevention Plans (SWPPP) and to obtain permit coverage from EPA under the NPDES General Permit for Storm Water Discharged From Construction Activities. Copies of the Construction Storm Water Pollution Prevention Plan for the Rock Creek and Big Hurrah Mines that have been submitted are available for public review. Copies of the SWPPP can be obtained by contacting Greg Drzewiecki in the ADEC Anchorage office. During mine operations Alaska Gold Company is required to develop and implement storm water pollution prevention plans and to obtain permit coverage from EPA under the NPDES Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activities.

3. Comment: The draft permit does not meet the requirements for removal of ponded water from solid waste storage facilities.

Response: ADEC has granted Alaska Gold Company (AGC) a waiver under 18 AAC 60.900(a)(2) for the Rock Creek Tailings Storage Facility (TSF) from the provision in 18 AAC 60.225 that requires that ponded water be removed from waste disposal facilities within 7 days. This waiver is noted on the cover page of the final Waste Management Permit. 18 AAC 60.900(a)(2) allows for an applicant to apply for a waiver from provisions in 18 AAC 60 if “the proposed alternative action will provide equal or better environmental protection... than compliance with the identified provision”. The waiver from 18 AAC 60.225 was granted for the TSF based on the following information contained in AGC’s request for waiver:

The TSF is designed to hold paste tailings and to collect seepage and precipitation runoff from those tailings in temporary storage. These solutions may have the potential to include elevated metals concentrations. The facility design provides better protection for the environment than a typical landfill by providing a controlled means to collect seepage and precipitation runoff from the tailings.

This ensures that there will be no water quality impacts associated with the facility.

The facility design is based on a thermal and seepage study report that indicates the best method of controlling and containing seepage is to construct a lined tailings embankment using a geomembrane liner that extends into the underlying bedrock. Seepage collection systems are integrated into the base of the embankment as a contingency collection measure. Monitoring wells will be established down-gradient of the dam to ensure all systems are functioning properly.

Ponding against the face of the embankment will not jeopardize the stability of the tailings stored within the facility. Closure of the facility and breaching of the embankment requires that the tailings have ceased producing seepage, and that the stockpile is at a stable slope and capped. Ponding will not occur after closure of the tailings dam and seepage collection system.

Waste Management Permit Section 1.5.5 has been added to the permit to address the issue of removal of ponded water from the inert solid waste landfills. Waste Management Permit Section 1.5.5 states: "The permittee shall construct inert solid waste landfills such that seasonal flooding is temporary and shall remove all ponded water from the inert solid waste landfills within 30 days."

Waste Management Permit Section 1.7.3 has been added to the permit to address the issue of removal of ponded water from the PAG temporary storage area. Waste Management Permit Section 1.7.3 states: "The permittee shall remove all ponded water from the PAG temporary storage area within 7 days."

The development rock stockpiles at Rock Creek are not considered a waste as defined by 18 AAC 60.005(c)(8) since information submitted during the permit application process indicates that there will be no environmental problem associated with management of the development rock at Rock Creek. 18 AAC 60.225 is not applicable to the development rock stockpiles at Rock Creek.

- 4. Comment: The draft permit does not comply with regulations governing landfills located on permafrost. There is no explanation of whether alternative locations for the TSF or the PAG development rock stockpile were available, and if so, why they were not suitable as substitute facilities, as required by 18 AAC 60.227.**

Response: 18 AAC 60.227 that states: "(a) The department will not approve the construction of a landfill on a site underlain by permafrost unless the owner or operator can demonstrate that a practical alternative to the site chosen does not exist. (b) Landfills on permafrost must be designed and operated so that the permafrost remains frozen to the greatest extent practical, and water does not pool anywhere on the site."

The applicant has submitted the following information to ADEC with respect to the location of the TSF on permafrost at Rock Creek:

Alaska Gold has sited the TSF landfill at the present location to minimize environmental impacts. Discontinuous permafrost is prevalent around the proposed mine site. The areas that do not have permafrost are the stream and river valleys and the high value wetlands. The landfill was specifically sited to avoid these environmentally sensitive areas.

In planning the design and construction of the Tailings Storage Facility, excavation at the site has been scheduled for the winter months to minimize impacts related to exposure. Constructed fill material will be placed back over the permafrost while temperatures are still low. A thermal evaluation for the site was conducted and is contained within the Rock Creek Mine Plan of Operations under the title Thermal and Seepage Report. The results of this evaluation determined that extending the geomembrane liner on the face of the Tailings Storage Facility into bedrock would, through maximum control of seepage, provide greater permafrost protection than the installation of thermo-siphons at the site.

The PAG development rock stockpile placement is not proposed to occur on permafrost as indicated by geotechnical investigation test pits excavated at the Big Hurrah site.

The ADEC has found that the applicant has demonstrated that a practical alternative to the chosen site for the waste management facilities at Rock Creek does not exist and that the facilities are designed to ensure that the permafrost remains frozen to the greatest extent practical.

5. **Comment: The draft permit contains no requirement to report surface water quality monitoring results, outside of the quarterly and annual reports the permittee must submit to DEC. Likewise, no such procedure for submission of surface water monitoring reports is found in the monitoring plan. This reporting requirement as well as the specific conditions of the monitoring requirements must be included in the final waste management permit for the Rock Creek Project.**

Response: Waste Management Permit Section 1.9.1 requires that the permittee submit quarterly monitoring reports summarizing the inspection and monitoring results set out in Section 1.8. Waste Management Permit Section 1.8.1 requires that the monitoring plan include: “monitoring of surface waters near the sites, as required in the Rock Creek Project Monitoring Plan to ensure that water quality standards are not exceeded.”

6. **Comment: The draft permit does not contain conditions to ensure that the mine facilities will be safe from damage caused by natural hazards.**

Response: The TSF design has undergone review by the ADNR Dam Safety Program. The design review covered potential hazards associated with seismic events and degradation of permafrost. The final Waste Management Permit considered ADNR Dam Safety Program review of the TSF embankment. Additionally, see Comment 22 of this response for additional information on seismic risk analysis.

7. **Comment: The draft permit omits important visual monitoring requirements.**

Response: Waste Management Permit Section 1.8.1.1 has been updated as follows:

Weekly visual monitoring of the facilities for signs of damage or potential damage from settlement, ponding, leakage, erosion, thermal instability, frost action, thawing of waste or operations at the site. Weekly visual monitoring of facilities shall also include above-grade portions of groundwater monitoring devices, visible portions of liners - including slippage of flexible liners or damage to its anchor(s) - containment structures, retaining walls, erosion control structures and diversion structures to ensure that all are not damaged and are operating as designed.

Weekly visual monitoring shall include checking for evidence of waste escaping the facilities, leachate from facilities, unauthorized waste disposal and violations of permit conditions contained in this permit. Visual monitoring shall be documented.

- 8. Comment: The monitoring locations for solid waste disposal facilities, referred to in the regulations as “points of compliance,” will “normally be located no more than 50 feet outside a waste management area.”**

Response: The following has been added to Waste Management Permit Section 1.8.1.2: “The permittee shall establish surface water monitoring sites as points of compliance in Rock Creek and Little Hurrah Creek within 50 feet of the waste disposal areas where practicable, to ensure that water quality standards are not exceeded.”

- 9. Comment: Groundwater monitoring requirements are inadequate for the Big Hurrah mine site.**

Response: Waste Management Permit Section 1.8.1.8 requires the permittee to update and maintain the monitoring plan to include, “Monitoring of any seepage, leachate, runoff and down-gradient groundwater of the PAG development rock storage area.” The monitoring plan discusses that HMW-3, a baseline monitoring station at Big Hurrah, will be relocated to a location approved by ADEC upon construction of the development rock stockpile. This well will be located to ensure that groundwater down-gradient of the PAG development rock stockpile is monitored, as required in Waste Management Permit Section 1.8.1.8.

- 10. Comment: No monitoring is proposed for the PAG development rock dump.**

Response: Waste Management Permit Section 1.8.1.8 requires the permittee to update and maintain the monitoring plan to include “Monitoring of any seepage, leachate, runoff and down-gradient groundwater of the PAG development rock storage area.”

- 11. Comment: There is no provision for the amount of waste material to be treated and disposed of in Section 1.2.9.**

Response: Waste Management Permit Section 1.2.1 states: “The waste materials covered under this Section are limited to a facility maximum of 9,000,000 dry tonnes of mine tailings disposal, meeting the conditions in this permit, deposited into the Rock Creek TSF.”

Waste Management Permit sections 1.1.5 and 1.7 have been updated and require that the permittee implement a geochemical characterization plan to determine the PAG cutoff ratio (the cutoff ratio defines the cutoff between PAG and non-PAG development rock), and seek ADEC approval of both the development rock characterization plan and the PAG cutoff ratio, prior to disposal or storage of development rock at Big Hurrah.

- 12. Comment: Section 1.2.11 provides no explicit standard for “other material” that may be disposed of in an inert waste landfill.**

Response: 18 AAC 60.990(64) defines inert waste as follows: “(64) "inert waste" means solid waste that has a low potential to pollute air or water, and that does not normally attract wildlife; “inert waste” includes coal power plant ash, scrap metal, auto fluff, construction and demolition waste, and pavement rubble; "inert waste" does not include asphalt material that contains asbestos”.

- 13. Comment: This provision contains no standards for the “pollution prevention concepts,” nor is there any reference to the types of plans this provision is meant to address.**

Response: Waste Management Permit Section 1.15 has been added to address pollution prevention strategy requirements.

- 14. Comment: Permit Section 1.4.4 provides no standards for dust control; “reasonable measures” and “other effective measures” provide no guidance as to what is required by the permit. Specific requirements must be added to the permit to make it explicit and enforceable.**

Response: 18 AAC 50.045(d), governing air quality emissions, states: “A person who causes or permits bulk materials to be handled, transported, or stored, or who engages in an industrial activity or construction project shall take reasonable precautions to prevent particulate matter from being emitted into the ambient air.” The waste management permit regulates the disposal of waste at discrete sites. Waste Management Permit Section 1.4.4, and 18 AAC 50.045(d), allows the ADEC discretion to determine what reasonable measures are. At other mine sites where dust/particulate emissions have been determined by ADEC to be a problem, ADEC has required the permittee to create a dust control plan. If a dust control plan is created, approved by ADEC and followed by the permittee it has been determined to constitute reasonable measures. As stated earlier in this comment response, the ADEC will review any proposed changes in operations and/or requests for approval and determine if a public notice is required in accordance with 18 AAC 15.100.

Additionally, the applicant has applied for an Air Quality Control Permit for construction activities with ADEC Air Permit Program.

- 15. Comment: Permit Section 1.4.7 provides no standards for placement of development rock; “adequate blending” and “prevent acid production” provide no guidance as to what is required by the permit.**

Response: The development rock stockpiles at Rock Creek are not considered a waste as defined by 18 AAC 60.005(c)(8) since information submitted during the permit application process indicates that there will be no environmental problem associated with management of the development rock at Rock Creek. However, the Waste Management Permit Section 1.4.7 is included in the permit to ensure that the development rock at Rock Creek is placed in a manner such that it does not become a waste as defined in 18 AAC 60.005(c)(8).

- 16. Comment: Section 1.4.8 states, “The permittee shall minimize run-on water from entering the TSF and the surface landfills from upgradient sources of surface and groundwater.” This provision provides no standards for “minimizing” run-on water.**

Response: Waste Management Permit Section 1.4.8 has been updated as follows: “The permittee shall construct and maintain diversion ditches, surface grading or other measures to minimize run-on water from entering the TSF and the inert solid waste landfill facilities from upgradient sources of surface and groundwater”.

- 17. Comment: Section 1.4.9 states, “The permittee shall control and treat surface water, groundwater and seepage as necessary to prevent off-site water quality exceedances.” This provision provides no standards to prevent off-site water quality exceedances; “control and treat” various waters provides no guidance as to what is required by the permit.**

Response: Waste Management Permit Section 1.4.9 has been deleted since Waste Management Permit Section 1.2.12 and Waste Management Permit Section 1.10.3 cover the requirements for the permittee to follow if water quality standard exceedances are detected.

- 18. Comment: Section 1.8.1.7 provides, “Geochemical monitoring of development rock produced at Big Hurrah designed to detect and segregate PAG development rock in accordance with Section 1.2.6 and 1.7.1.2.” Neither of those sections provides for any standards regarding geochemical monitoring of development rock.**

Response: The reference to Waste Management Permit Section 1.2.6 has been deleted. Waste Management Permit Section 1.7.1.2 references the criteria that must be met in the operational development rock characterization and handling plan that is required to be submitted to ADEC prior to disposal of any development rock at Big Hurrah. As stated earlier in this comment response, the ADEC will review any proposed changes in operations and/or requests for approval and determine if a public notice is required in accordance with 18 AAC 15.100.

- 19. Comment: Section 1.8.1.10 states, “Wildlife monitoring as required in Section 1.4.17.” As discussed in Section II.A.1, “attractive area” is not defined and does not provide an explicit and enforceable standard for the permit.**

Response: Waste Management Permit Section 1.4.16 has been updated as follows: “The permittee shall implement hazing or other effective measures as necessary to ensure that any waste disposal area or area of open water in the mine area does not attract wildlife. Any wildlife casualties shall be reported to the Department and to the appropriate state and federal agencies.” Waste Management Permit Section 1.4.16, and 18 AAC 60.010, allows the ADEC discretion to determine what an attractive area and/or effective measures are.

- 20. Comment: Section 1.10 details the requirements for corrective actions. Any specific requirements for those corrective actions should be included within the permit to make them explicit and enforceable.**

Response: Waste Management Permit Section 1.10 allows for the permittee and the ADEC to use discretion in determining the corrective action appropriate for the given situation. Depending on the situation the corrective actions required could vary greatly.

- 21. Comment: Section 1.11 provides requirements for temporary closure. As with Section 1.10, any specific requirements for temporary closure should be included within the permit to make them explicit and enforceable.**

Response: Waste Management Permit Section 1.11 allows for the permittee and the ADEC to use discretion in determining the appropriate temporary closure plan for the given situation. Depending on the situation, including the point in the mine life, the temporary closure plan could vary greatly.

- 22. Comment: The Maximum Credible Earthquake should have been used as the design event for the Tailings Storage Facility and the waste rock dumps since they will have to withstand seismic events in perpetuity.**

Response: The Rock Creek Project Seismic Hazard Assessment dated September 26, 2005 (Rock Creek SHA) presented a limited, deterministic seismic hazard assessment (DSHA) as well as a probabilistic seismic hazard assessment (PSHA) to establish the seismic design parameters for the project. A maximum design earthquake (MDE) was selected based on the PSHA. According to

engineering regulations published by the U.S Corps of Engineers (ER1110-2-1806, Engineering and Design - Earthquake Design and Evaluation for Civil Works Projects), an MDE may be characterized based on either a PSHA or a DSHA. However, a maximum credible earthquake (MCE) is selected based on a DSHA. The commenter's statement that an MCE is "equivalent to a 1 in 10,000 year event" is inconsistent with this guidance. The Rock Creek SHA did not specify an MCE for the site.

The Corps guidance indicates that the MDE is equal to the MCE when designing a "critical" structure where "catastrophic loss of life" or "irreversible threat to human life due to the release or inundation of hazardous, toxic, or radioactive materials [sic]" could occur from the failure of the system. For non-critical features, the MDE may be selected as a lesser earthquake to provide an "economical design meeting appropriate safety standards." The obvious effect of a lower probability event on the proposed design of the closed tailings storage facility (TSF) and rock dumps is expected to be more deformation than estimated under the proposed MDE, respectively. The seismic design parameters are appropriate given the current understanding of the risks posed by the project.

WASTE MANAGEMENT – LIQUIDS

1. **Comment: There is no mention in this table about monitoring water in the recycle water pond. It appears from drawing of this pond that water in the pond is accessible to birds.**

Response: Waste Management Permit Section 1.8.1.11 has been added to the permit and requires the permittee to update and maintain the facility monitoring plan to include "Water quality monitoring of the recycle water pond".

2. **Comment: Since water in the recycle water pond contains cyanide, monitoring for cyanide levels needs to be included in the monitoring plan.**

Response: Waste Management Permit Section 1.8.1.11 has been added to the permit and requires the permittee to update and maintain the facility monitoring plan to include "Water quality monitoring of the recycle water pond".

3. **Comment: At Rock Creek, there are apparently no monitoring wells proposed for the waste rock dumps or the reinjection wells. Monitoring wells should be located downgradient of the injection wells, and these monitoring wells would also serve as long term monitoring wells for the north waste rock dump after mine closure.**

Response: Waste Management Permit Section 1.6.6 states: "Prior to disposal of wastewater into the injection system, if ADEC approved down-gradient monitoring wells are not present, the permittee shall install a monitoring well(s) down-gradient of each proposed injection site in location(s) approved by ADEC. Six months of bi-monthly (twice a month) water quality sampling (12 samples) shall be conducted in the down-gradient monitoring well(s) prior to discharge of treated pit dewatering water to the injection system.

Seep monitoring and surface water monitoring in the diversion channels down-gradient of the development rock dumps are contained in the monitoring plan (sections 5.1.1.2 and 4.1.1.1, respectively). Additionally, geochemical monitoring of the development rock is contained in the monitoring plan Section 7.2. The results of the development rock geochemical monitoring, in conjunction with other site monitoring; will be used in determining whether additional water monitoring should be required at Rock Creek.

At closure ADEC will decide on the appropriate post-closure monitoring locations to ensure that any potential long term water quality impacts are detected as required by Waste Management Permit Section 1.12.6.

4. **Comment: At Big Hurrah, there are no apparent proposed locations for monitoring wells downgradient of the injection wells, most of the waste rock dump, or the pit. Since there will be potentially acid generating material and/or neutral pH generating material located at these sites, long term groundwater monitoring well locations should be selected/required as well.**

Response: Waste Management Permit Section 1.6.6 states: “Prior to disposal of wastewater into the injection system, if ADEC approved down-gradient monitoring wells are not present, the permittee shall install a monitoring well(s) down-gradient of each proposed injection site in location(s) approved by ADEC. Six months of bi-monthly (twice a month) water quality sampling (12 samples) shall be conducted in the down-gradient monitoring well(s) prior to discharge of treated pit dewatering water to the injection system.”

Waste Management Permit Section 1.8.1.8 requires the permittee to update and maintain the monitoring plan to include, “Monitoring of any seepage, leachate, runoff and down-gradient groundwater of the PAG development rock storage area.” The monitoring plan discusses that HMW-3, a baseline monitoring station at Big Hurrah, will be relocated to a location approved by ADEC upon construction of the development rock stockpile. This well will be located to ensure that groundwater down-gradient of the PAG development rock stockpile is monitored, as required in Waste Management Permit Section 1.8.1.8.

Seep monitoring and surface water monitoring in Charlotte’s Creek (located down-gradient of the development rock dump) are contained in the monitoring plan (sections 5.2.1.2 and 4.2.1.1, respectively). Additionally, geochemical monitoring of the development rock is contained in the monitoring plan Section 7.2. The results of the development rock geochemical monitoring, in conjunction with other site monitoring; will be used in determining whether additional water monitoring should be required at Big Hurrah.

At closure ADEC will decide on the appropriate post-closure monitoring locations to ensure that any potential long term water quality impacts are detected as required by Waste Management Permit Section 1.12.6.

5. **Comment: Will the Class V injection permit be a general or a site-specific permit?**

Response: The permittee has applied for an EPA Underground Injection Control (UIC) Class V Injection Well Permit. At this time the state does not know whether the EPA intends to issue an individual or general permit for the injection wells.

WASTE MANAGEMENT – CYANIDE

1. **Comment: There is no discussion in any of the project literature of the ferric chloride water treatment system for arsenic removal.**

Response: Plans for the ferric chloride water treatment system are required to be approved by ADEC prior to construction and operation of the water treatment plant per Waste Management Permit sections 1.6.3 and 1.6.4.

Waste Management Permit Sections 1.6.3 states: “The permittee shall submit plans of the wastewater treatment system to ADEC and receive ADEC approval prior to construction of the wastewater treatment plant.”

Waste Management Permit Section 1.6.4 states: “The permittee shall submit as built drawings to ADEC and receive ADEC approval prior to disposal of wastewater to the injection system.”

2. **Comment: There is no significant discussion of the ferrous sulfate cyanide destruction system - its potential effectiveness or monitoring.**

Response: Ferrous sulfate cyanide destruction is a common practice in the mining industry and has been shown to be effective at reducing cyanide concentrations in tailings exposed to cyanide. Waste Management Permit Section 1.2.3 sets limits on the allowable cyanide concentrations for tailings deposited into the TSF and requires that any other cyanide destruction method proposed by the permittee be approved by ADEC. Monitoring Plan Section 7.2.1 requires a daily grab sample of tailings to be subjected to analysis for WAD cyanide.

3. **Comment: All cyanide complexes need to be monitored for as they pose risks to the environment and may persist for many years.**

Response: Waste Management Permit Section 1.4.1 requires that the Tailings Storage Facility (TSF) operate as a no discharge facility. Waste Management Permit Section 1.6 contains a limit of 5.2 ug/L for Weak Acid Dissociable cyanide (WAD CN) for water that is injected. This limit is based on the aquatic life criteria contained in the Alaska Water Quality Standards (18 AAC 70). The DEC Waste Management Permit, Section 1.6 has been updated to include a total cyanide limit of 200 ug/L based on the drinking water/human health criteria contained in the AK WQS (18 AAC 70). The total cyanide analysis measures for the cyanide complexes that the commenter expressed concerns about.

4. **Comment: Our sub-arctic environment likely inhibits the movement and breakdown of cyanide and site specific criteria must be detailed in order to address the long term nature of cyanide presence in our environment.**

Response: Waste Management Permit Section 1.4.1 requires that the Tailings Storage Facility (TSF) operate as a no discharge facility. Waste Management Permit Section 1.6 contains a limit of 5.2 ug/L for Weak Acid Dissociable cyanide (WAD CN) for water that is injected. This limit is based on the aquatic life criteria contained in the Alaska Water Quality Standards (18 AAC 70). The DEC Waste Management Permit, Section 1.6 has been updated to include a total cyanide limit of 200 ug/L based on the drinking water/human health criteria contained in the AK WQS (18 AAC 70). The total cyanide analysis measures for the cyanide complexes that the commenter expressed concerns about.

The Waste Management Permit also requires post-closure monitoring of surface and groundwater to ensure that any potential long term water quality impacts are detected as required by Waste Management Permit Section 1.12.6.

5. Comment: Free cyanide the most deadly form is only mentioned in Section 1.2.2.12 and presumably will be allowed to be disposed of in unspecified concentrations.

Response: The TSF is a permitted treatment works as defined in AS 46.03.900. Waste Management Permit Section 1.4.1 requires that the TSF be operated as a no discharge facility. 18 AAC 70.010(c) details that the Alaska Water Quality Standards (18 AAC 70) do not apply to treatment works authorized under 18 AAC 60 but 18 AAC 70 does apply to adjacent surface and ground waters. As detailed below, the Waste Management Permit places limits for cyanide on the waste deposited into the TSF (a permitted treatment works) to ensure protection of human health and wildlife.

Waste Management Permit Section 1.2.2.12 prohibits the disposal of tailings that have been exposed to cyanide into the TSF without being subjected to cyanide destruction. Waste Management Permit Section 1.2.3 requires that tailings exposed to cyanide be subjected to cyanide destruction and places limits on the cyanide levels that can be discharged into the TSF. Waste Management Permit Section 1.2.3 states: “Prior to disposal of tailings exposed to cyanide to the TSF, the tailings shall be subjected to cyanide destruction using the SO₂ /air process or other suitable cyanide destruction process approved by the Department. At least 90% of the samples shall contain less than 10 mg/kg of WAD cyanide and none of the samples shall contain more than 25 mg/kg of WAD cyanide.”

Waste Management Permit Section 1.2.4 places limits on the cyanide levels that can be contained in the water discharged into the TSF or contained in the recycle water pond. Waste Management Permit Section 1.2.4 states: “Water recycled to the TSF or contained in the water recycle pond shall not exceed the following WAD CN levels: at least 90% of the samples shall contain less than 10 mg/L of WAD cyanide and none of the samples shall contain more than 25 mg/L of WAD cyanide.”

WAD cyanide analysis includes free cyanide and other weak acid dissociable cyanide complexes and is considered a conservative estimate of free cyanide.

As stated earlier, the Alaska Water Quality Standards (18 AAC 70) do apply to surface and ground waters adjacent to a treatment works. Waste Management Permit Section 1.8 requires that the permittee maintain a monitoring plan, including water quality monitoring for WAD and total cyanide, to ensure that water quality standards are not exceeded in adjacent surface or ground waters.

6. Comment: Section 1.2.10 does not describe “statistically significant” when it describes exceedances of state water quality standards at the monitoring wells or the toe of the TSF. It also mentions a “standard” but does not describe the standard. Without describing how the statistically significant increase will be characterized, it could favor pollution events.

Response: Waste Management Permit Section 1.10.2 references 18 AAC 60.820-860 for determination of statistical significance. The “standard” references are the Alaska Water Quality Standards (18 AAC 70).

RECLAMATION

1. **Comment: The post-mining use as a storage site for material source sales that is proposed by AGC does not appear to involve the use of the waste dumps themselves or the waste material itself. The use of waste dump material for "material source sales" would not only be imprudent, but would also be potentially illegal (i.e. against conditions in the ADEC Solid Waste Permit). The waste rock is not an appropriate source for "material sales."**

Response: The development rock stockpiles at Rock Creek are not considered a waste as defined by 18 AAC 60.005(c)(8) since information submitted during the permit application process indicates that there will be no environmental problem associated with management of the development rock at Rock Creek. However, the Rock Creek Monitoring Plan contains surface water monitoring in the diversion ditches down-gradient of both development rock stockpiles at Rock Creek and geochemical testing of the development rock material to ensure that any potential for acid rock drainage and/or metals leaching is detected and corrective actions can be implemented if detected.

Additionally, Waste Management Permit Section 1.14.17 has been added. Waste Management Permit Section 1.4.17 states: "Stockpiled development rock and/or development rock from the tailings storage facility embankment shall not be removed from the project site, unless the material is tested to ensure that it will not produce acid rock drainage and/or metal leaching and that the material removal will not create geochemical or geotechnical instability of the surrounding material. Any removal of development rock shall be specifically approved by ADEC in writing."

2. **Comment: What type of cover vegetation will be required?**

Response: In order to provide for long-term site stability, it is best to encourage growth of native species. However, as stated in Section 5.5.3 of the Rock Creek Mine Plan of Operations Volume 4- Reclamation Plan, broadcast seeding using a seed mix developed in consultation with the Alaska Plant Material Center will be done on the tailings storage facility.

3. **Comment: The rock being excavated from this mine is highly contaminated, and substantial closure problems are likely. An underground mine should be considered at this site, rather than an open pit, due to the contamination issues. As presently proposed, it is likely that environmental problems will be created which will threaten water quality around the mine for a very long time.**

Response: Management of all potential contaminants are a high priority at both mine sites and a monitoring program, as required in the Waste Management Permit, is in place to ensure that the risk of water quality impacts are minimized. Waste Management Permit sections 1.8.1.2 and 1.8.1.3 require that the permittee maintain monitoring procedures in an ADEC approved monitoring plan for surface and groundwater quality near the site to ensure that water quality standards are not exceeded as a result of activities conducted at the facility.

The Waste Management Permit Section 1.13.4 requires that the permittee post a financial responsibility to cover the costs of 30 years of post-closure monitoring at the facilities. At closure ADEC will decide on the appropriate post-closure monitoring locations to ensure that any potential long term water quality impacts are detected as required by Waste Management Permit Section 1.12.6. The long term post closure monitoring schedule can be adjusted as allowed in Waste Management Permit Section 1.12.6, which states: "Post-closure monitoring of the groundwater and visual monitoring for settlement and erosion shall occur according to the sampling schedule set out in

the current Monitoring Plan approved by the Department. This schedule and the parameters monitored may be modified by the Department based on the monitoring results received.”

BONDING

1. Comment: How large will the bond be?

Response: The initial bond amount will be \$6,844,700.

2. Comment: Will this bond cover costs of long term water treatment, or will there be a long term fund for water management/treatment/monitoring?

Response: The bond will cover the costs of 30 years of post-closure monitoring and one-time treatment of water in the tailings impoundment. Based on the information submitted to date, the State does not believe that recurrent or long-term water treatment will be required. However, during operations water quality and geochemical monitoring analyses will be reviewed to ensure that the long term water quality predictions submitted during permit application are accurate. If the state believes that water quality standards may be exceeded post-closure, at either site, that bond amount will be adjusted accordingly.

3. Comment: Until there is a firm commitment to actually construct and test the treatment plant, these costs must be factored into the reclamation surety calculations.

Response: Waste Management Permit Section 1.6.5 has been added, which states:

If an ADEC approved wastewater treatment system is not constructed and operational prior to disposal of tailings into the TSF the permittee shall update the financial responsibility amount required in Section 1.13.1 to include costs for construction of an ADEC approved wastewater treatment system at the Rock Creek site.

If an ADEC approved wastewater treatment system is not constructed and operational prior to disposal or storage of development rock at Big Hurrah the permittee shall update the financial responsibility amount required in Section 1.13.1 to include costs for construction of an ADEC approved wastewater treatment system at the Big Hurrah site.

4. Comment: Approval of a reclamation plan that "excludes complete reclamation of the development rock dumps" at the Rock Creek and Big Hurrah sites could lead to an unstable and potentially unsafe closure.

Response: The reclamation plan is consistent with the alternative land uses that the company has proposed for the mine sites, which are on private lands. Offsite impacts must still be mitigated.

5. Comment: A more rigorous long term monitoring schedule should be required. The costs of the better long term monitoring would not add significantly to the overall reclamation surety.

Response: The long term post closure monitoring schedule is consistent with what has been approved at other mines in Alaska. The long term post closure monitoring schedule can be adjusted as allowed in Waste Management Permit Section 1.12.6, which states: “Post-closure monitoring of the groundwater and visual monitoring for settlement and erosion shall occur according to the sampling

schedule set out in the current Monitoring Plan approved by the Department. This schedule and the parameters monitored may be modified by the Department based on the monitoring results received.”

6. **Comment: No inflation factor is built in to the Rock Creek cost estimate. Unless the financial surety is to be reviewed annually, CSP2 recommends including an inflation factor of 3%/yr, and the US Forest Service recommends 0% - 3%/yr. Inflation is currently increasing in the US.**

Response: A cash bond will be posted and the funds will be placed in an interest-bearing account. In addition, the bond will be periodically reviewed and adjusted accordingly.

7. **Comment: The indirect cost estimates for the Rock Creek financial surety in the project application are underestimated.**

Response: The State has reviewed the bond and adjusted the rate of indirect costs to 35 percent of direct costs. This is in line with comparable projects in Alaska.

8. **Comment: The assumption of \$3.19/gallon for fuel costs appears to be suspect.**

Response: The State obtained a quote for fuel at \$3.95/gallon in Nome and the bond calculation was revised. The State will periodically review such assumptions and adjust the bond accordingly.

9. **Comment: The proposal to bond for long term monitoring during years 1, 2, 5, 10, 20 and 30 after reclamation does not provide frequent enough monitoring to provide for the continuation of baseline monitoring that was conducted during mine operation, or to detect worsening conditions that could lead to water quality problems. The costs of yearly monitoring for years 1-5, biannual monitoring for years 7, 9, 11; and monitoring every 5 years for years 15-30 do not add significantly to the overall reclamation surety.**

Response: The long term post closure monitoring schedule is consistent with what has been approved at other mines in Alaska. The long term post closure monitoring schedule can be adjusted as allowed in Waste Management Permit Section 1.12.6, which states: “Post-closure monitoring of the groundwater and visual monitoring for settlement and erosion shall occur according to the sampling schedule set out in the current Monitoring Plan approved by the Department. This schedule and the parameters monitored may be modified by the Department based on the monitoring results received.”

10. **Comment: There is no provision in the reclamation surety or long term monitoring for any routine repair of the tailings storage facility or the waste dumps. Minor erosion on the face of the dam is likely to occur, and provision should be made to set aside some funding to bring heavy equipment to the sites in order to occasionally patch erosional features on the tailings dam or the waste dumps that, if neglected, could lead to releases of waste material or partial failure of a structure. Some level of provision in the financial surety should be made for long term maintenance of the tailings storage facility and the waste rock dumps.**

Response: The bond will not be released until the site is stable in accordance with Waste Management Permit Section 1.12.3.

WATER QUALITY/HYDROLOGY

1. **Comment:** The draft permit does not adequately protect against the production of polluted runoff from waste storage facilities. How will the water that rinses the tailings be managed to protect surface and groundwater?

Response: The TSF is designed as a no discharge facility. Waste Management Permit Section 1.4.1 requires that the permittee operate and maintain the TSF as a no discharge facility.

2. **Comment:** DEC should receive all monitoring results as they are available so that it can quickly work with AGC to remedy problems at the mines as well as undertake any enforcement that may be necessary. Sixty days is an excessive amount of time to meet reporting requirements.

Response: Waste Management Permit Section 1.10.3 requires that the permittee notify ADEC within 24 hours of receipt of a monitoring result that shows an exceedance of water quality standards or of the permit limits.

3. **Comment:** This table shows the modeling results for runoff-infiltration-evaporation for the different closure scenarios for the Rock Creek tailings storage facility. In the model a rainfall of 554 gpm is assumed. However, for the development rock model run for this effort a rainfall of 438 gpm was used (Table 8). Why is there a difference? Is the difference due to run-on from drainage around the TSF?

Response: The same rainfall was used for both facilities. The difference in the volumetric rate is due to the difference in the areas of each facility. The depth of rainfall was multiplied by the area of each facility to estimate the volumetric rainfall rate.

4. **Comment:** Why is infiltration higher with light vegetation than with no vegetation for the cover alternative? Note that the same relative prediction is made for the waste rock at Big Hurrah.

Response: The ADNR Reclamation Plan Approval requires that prior to initiation of reclamation of the tailings facility, Alaska Gold Company must submit to ADNR final facility closure plans and schedule, for review and approval, that are developed to minimize surface run-on water, water infiltration into the tailings, and that demonstrate the geotechnical stability of the facility. The final facility closure plans must include consideration of site water quality and tailings geochemical monitoring data and shall specify final slopes, cover design, growth medium replacement depths, and surface flow control and diversion ditches. The final facility closure plan must include an updated prediction of precipitation infiltration rates for the final cover design.

Final facility closure plans are also required for the development rock dumps. Prior to initiation of reclamation of the development rock dumps, Alaska Gold Company must submit to ADNR final facility closure plans and schedule, for review and approval. The final facility closure plans must include consideration of water quality monitoring data, waste rock characterization records, development rock geochemical monitoring results and the results of the required environmental audit. If seepage or runoff from the development rock dumps exceeds water quality standards, ADNR may require the reclamation of these facilities to minimize infiltration and/or impacts from runoff and may require covers to include a low-permeability layer, growth medium replacement, seed / fertilizer application and also surface flow diversion ditches. The ADNR may require revisions to the infiltration rate predictions provided by the company.

5. **Comment: Other rock at the mine is also likely to release contaminants, and surface and subsurface discharge of this water should be monitored for signs of sulfate and other constituents (e.g. arsenic, antimony, selenium) that can degrade water quality. Management of arsenic should be a high priority.**

Response: Waste Management Permit sections 1.8.1.2 and 1.8.1.3 require that the permittee maintain monitoring procedures in an ADEC approved monitoring plan for surface and groundwater quality near the site to ensure that water quality standards are not exceeded as a result of activities conducted at the facility. The monitoring plan includes six surface water sampling sites, including two in the diversion channel down-gradient of the development rock stockpiles, at the Rock Creek project site, and three surface water sampling sites at the Big Hurrah project site. The analyte list for surface and groundwater sampling includes the parameters that the commenter listed. The AK WQS for sulfate is 250 mg/L, which is applicable to all waters. Management of arsenic, and all other potential contaminants, is a high priority at both mine sites and a monitoring program, as required in the Waste Management Permit, is in place to ensure that the risk of water quality impacts are minimized. Waste Management Permit Section 1.6 includes water quality limits, including arsenic, for treated water to be discharged to the injection system.

6. **Comment: A detailed discussion of water quality in the pit should be provided, as well as water quality standards that will be required.**

Response: A detailed discussion of the pit lake water quality modeling was included in the Plan of Operations, Volume 8, Geochemistry and Groundwater.

7. **Comment: A discussion was presented in a related document that requests a stream reclassification of the Rock Creek and Lindblom Creek. It appears that this is a de facto admission that water quality will be degraded. While arsenic in the basin is clearly elevated, any change in classification of the stream should be accompanied by water quality criteria that do not allow any degradation beyond the existing water quality, including sulfate.**

Response: Alaska Gold Company has filed a petition with the ADEC for reclassification of Rock Creek and Lindblom Creek due to the presence of naturally occurring elevated levels of arsenic above the drinking water criteria. The petition was filed under 18 AAC 70.230, Procedure for reclassification; reclassified waters. The ADEC is reviewing the applicant's petition for reclassification, and, if the ADEC finds that a reclassification is appropriate, the requirements in 18 AAC 70.230, including public process, will be followed. Regardless of the result of the reclassification, the Waste Management Permit requires that the permittee meet the applicable water quality standards (18 AAC 70), including anti-degradation, during operations and post-closure in any water discharged from the facility.

8. **Comment: How deep will the injection system be?**

Response: The injection system as proposed consists of an infiltration gallery and up to 15 injection wells, with depths ranging from 260 to 400 feet below ground surface at the Rock Creek site and up to 7 injection wells from 300 to 400 feet below ground surface at the Big Hurrah site. Section 1.6 of the Waste Management Permit places limitations on the quality of wastewater that can be discharged to the injection system to ensure that all applicable water uses are protected. The limits contained in Section 1.6 of the Waste Management Permit are based on the most stringent water quality criteria which are contained in 18 AAC 70 (the Alaska Water Quality Standards).

DRINKING WATER

1. **Comment: The close proximity of Nome's drinking water supply is an important water quality concern. The Rock Creek project is approximately 2.5 miles to the Nome springs recharge area and there needs to be some mention of Nome water quality.**

Response: The water supply for Nome is primarily from the Moonlight Springs area near Anvil Mountain. The recharge area has been delineated in several reports including "Recharge Area Evaluation For Moonlight Springs, Nome, Alaska", Report of Investigations 92-2, by J.A. Munter et al. and published by the Department of Natural Resources, Division of Geological and Geophysical Surveys (1992). The report looks at geology, water chemistry and isotopic chemistry of the area, and determines that the primary aquifer for Moonlight Springs is the marble unit that crops out of the Anvil Mountain hillside above the collection area at the springs. The western edge of the primary and secondary recharge areas is the Anvil Creek Fault which lies in the vicinity of Anvil Creek. This is, as noted, approximately two miles from the Rock Creek project. Additionally, the geochemical data suggest that the water at the springs has not traveled far from the point of infiltration, i.e. the recharge area is very localized. It is therefore highly unlikely that water from the Rock Creek project will have any affect on the water supply at Moonlight Springs.

AIR QUALITY

1. **Comment: At the Red Dog Mine, fugitive dust from trucks transporting ore is dispersed tens of miles in each direction from the road. The impact of that metal-laden fugitive dust, among others, is that plants take up the metals—plants that are gathered for subsistence purposes. DEC must address this issue either in the Draft Permit or in a separate air quality permit.**

Response: The trucks at Red Dog Mine haul fine-grained lead and zinc concentrates. If this material escaped from the trucks, it would be readily carried by the wind. Since it is high in lead or zinc, it could cause high concentrations of these metals on the ground and vegetation. However, the trucks that will travel between Big Hurrah and Rock Creek will carry coarse ore, not fine-grained concentrate. This coarse ore is not readily carried by the wind and does not contain high concentrations of metals other than gold.

2. **Comment: There are many families that fish near Safety Sound and we all make dry fish for winter use. The amount of dust should be controlled by watering the roads or other measures. The arctic tundra with it's flora and fauna will be covered with dirt. This valley has been one of the best berry picking areas accessible by road to Nome inhabitants.**

Response: The Alaska Dept. of Transportation & Public Facilities currently performs dust control measures on three sections of the road to Big Hurrah. ADOT&PF sometimes does this themselves and sometimes they use a contractor, such as Kawerak, Inc. If a member of the public feels that too much dust is being generated, they may ask the company to take voluntarily action or ask ADOT&PF to post a lower speed limit. Voluntary action could include such things as watering the road, applying a dust suppressant, or driving at a lower speed through a certain section of road. AGC has stated that it is willing to work with ADOT&PF on dust control.

3. **Comment: No mention of mercury was made in the Plan. Is mercury present in the ore at a concentration greater than 0.1 mg/kg. If it is, how will mercury be managed in the gold recovery facility. What controls will be placed on mercury release from the carbon kilns, furnaces and other thermal units at the mine. How much mercury will evaporate from the**

exposed and mineralized ore? How frequently will monitoring be required of each of the mercury emitting units at the mine?

Response: Air emissions are regulated under 18 AAC 50 Air Quality Control Regulations. The Alaska Gold Company has held several pre-application meetings with the ADEC Air Permits Program to discuss the air permit. The Air Permits Program raised the mercury issue during an April 2006 meeting and stated this topic must be addressed in the application for an air permit. The application is still pending.

WILDLIFE/SUBSISTENCE/HABITAT

1. **Comment: Big Hurrah mine tailings are proposed for use to improve the access road. Such usage will impact stream flow and sinuosity. Vegetative cover will be destroyed without stockpiling for later usage as vegetative bank for bank stabilization.**

Response: The proposed mine access road along Big Hurrah Creek is predominately located along an elevated terrace located on the left limit of the creek. A vegetated buffer will be maintained between the road and the creek. To avoid cutting into the hillside, there is one limited segment where the road will protrude into the active floodplain. At this location the creek will be relocated to the opposite side of the floodplain but will maintain its channel form and sinuosity. Removing the historic tailings will help reestablish the original, natural stream channel form and sinuosity. Alaska Gold has committed to work with OHMP to salvage established willows where feasible to replant them between the access road and stream to provide a buffer and edge vegetation for fish habitat.

2. **Comment: The access road to the mine site at Big Hurrah may be as long as two miles yet only two fish ponds are detailed for mitigation.**

Response: Alaska Gold is working cooperatively with the Department of Natural Resources Office of Habitat Management and Permitting on the design and implementation of the Big Hurrah stream improvement. The access road is not a new road being constructed, but an existing right-of way being improved which included removing traffic out of the streambed and onto a road bed at the side of the floodplain. This road improvement in and of itself is beneficial to the stream for the entire length of the road.

3. **Comment: Stream crossings in Big Hurrah creek are not bridged or otherwise protected from direct vehicle traffic. Simple and/or crude bridges will suffice to protect and mitigate from stream sedimentation but they are not detailed.**

Response: The single crossing of Big Hurrah Creek will include a large elliptical culvert (10 ft. 1 in. by 16 ft. 7 in.). During the life of the mine all vehicle crossings will utilize the culverted crossing.

4. **Comment: Given the potential toxicity of waste in the tailings storage facility (TSF) and the PAG development rock at Big Hurrah, specific precautions must be taken to prevent access of animals to storage facilities.**

Response: Waste Management Permit Section 1.4.16 has been updated as follows: “The permittee shall implement hazing or other effective measures as necessary to ensure that any waste disposal area or area of open water in the mine area does not attract wildlife. Any wildlife casualties shall be reported to the Department and to the appropriate state and federal agencies.” Waste Management

Permit Section 1.4.16, and 18 AAC 60.010, allows the ADEC discretion to determine what an attractive area and/or effective measures are.

- 5. Comment: The Solomon River watershed provides subsistence opportunity to subsistence users who fish that system or the adjacent marine waters, for salmonids and other non-salmon species such as cod that mingle within the Safety Sound and Solomon Riverine Estuary. The detailed fish pools for Big Hurrah Creek provide minimal habitat improvement and would be no improvement over what already exists.**

Response: It is not currently known whether Big Hurrah Creek provides overwintering fish habitat in its current condition. At a minimum, the proposed fish rearing ponds will provide summer rearing habitat for juvenile Coho salmon and to a lesser degree juvenile Dolly Varden.

- 6. Comment: The potentially acid generating rock pile in the Big Hurrah mine may expose aquatic life to acid mine drainage effects and may become unfit for human consumption. In turn marine mammals that may feed upon fish that migrate in and out of the Solomon River system may too become exposed to the effects of acid mine drainage and thereupon those effects may bio-accumulate.**

Response: Waste Management Permit Section 1.7.1.2.2 requires that the permittee, prior to storage or disposal of development rock at Big Hurrah, develop a PAG rock handling plan that ensures runoff water from the temporary storage stockpile does not reach waters of the State. The PAG temporary storage stockpile is designed such that potential acid mine drainage from the PAG stockpile at Big Hurrah is directed towards the mine pit. All water that accumulates in the pit will be collected and treated to meet all applicable state and federal standards then injected into the groundwater system.

In 2005 the Office of Habitat Management and Permitting (OHMP) collected juvenile Coho salmon and Dolly Varden in Big Hurrah Creek at the confluence of Little Hurrah Creek. The samples were submitted to a laboratory for analysis of heavy metal fish tissue levels. OHMP will continue to monitor fish tissue metals levels both during active mining and post-mining closure to determine whether fish are accumulating metals and whether additional treatment measures are necessary.

- 7. Comment: The Solomon River watershed will be exposed to fine sediments that have been encased in bedrock and would not have normally entered the Solomon River except by natural geologic forces. Sedimentation of the river substrate is a major factor in survival of aquatic life. The project plan does not detail how fine sediments will be controlled.**

Response: Protection against sedimentation in the Solomon River watershed has been incorporated into mine design at Big Hurrah. Downstream sedimentation will be minimized both by limiting construction to low water periods and through construction sequencing (i.e., constructing the new channel in the dry before water is diverted into it). Established willows and alders located along the edges of the historic tailings to be used for road construction will be removed and relocated along the road prism to reestablish a vegetated buffer between the road and the creek. This will reduce sediment runoff and maintain edge fish habitat values.

The primary risk of sediment discharge into surrounding surface water at Rock Creek and Big Hurrah Mines is from storm water runoff. Storm water discharges are regulated under the Environmental Protection Agency (EPA) National Pollution Discharge Elimination System (NPDES) program through coverage under general permits. During construction of the mines Alaska Gold Company is required to develop and implement Storm Water Pollution Prevention Plans (SWPPP) and to obtain permit coverage from EPA under the NPDES General Permit for Storm Water Discharged From

Construction Activities. Copies of the Construction Storm Water Pollution Prevention Plan for the Rock Creek and Big Hurrah Mines have been submitted and are available for public review. Copies of the SWPPP can be obtained by contacting Greg Drzewiecki in the ADEC Anchorage office. During mine operations Alaska Gold Company is required to develop and implement storm water pollution prevention plans and to obtain permit coverage from EPA under the NPDES Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activities.

8. **Comment: The Snake River watershed is important to Nome subsistence users for all endemic species of salmonids and non-salmon species, as well as all State or Federally managed game, furbearers and migratory birds. The Snake River watershed is vastly important for various berries and greens which could become impacted from the Rock Creek mine. Anadromous and nonanadromous salmonids utilize the Snake River watershed for juvenile rearing and adult life stages. Burbot exist within the project area; they exist in the Snake River and the Eldorado & Flambeau River. Their place at the top of the aquatic food chain in those systems mean that pollutants or other heavy metals will bio-accumulate in their flesh and may render them unsafe for human consumption or worse to become destroyed in their natural environment. Saffron Cod, Arctic Cod, and Rainbow Smelt are also top predators within the Snake River which seasonally use the Snake River watershed and are an important subsistence resource and they could bio-accumulate toxins or other heavy metals and render them unsafe for subsistence use or worse to become destroyed in their natural environment.**

Response: The Rock Creek project has been designed to avoid most impacts to aquatic resources. Zero discharge to surface water from the tailing facility will be maintained during mine operations; adjacent and surface waters will be diverted around the mine site. Upon closure, the aquatic life water quality standards will be met. Specific post-closure measures include sub-aqueous burial of potentially acid generating (PAG) waste rock in the mine pit to ensure non-acid generation in perpetuity.

The fisheries within the Snake River watershed are identified as important and their protection was incorporated into mine design. Water management includes recycling and consumption of all surface runoff water within the site facility footprint. Surface water and groundwater from adjacent areas will be intercepted and/or rerouted to avoid contact with site facilities or mining impacted areas. Groundwater not used in the process will be treated to meet all applicable state and federal standards prior to injection back into the groundwater system. As a result, water to be re-injected will be of superior water quality, with lower metals concentrations than the natural groundwater.

Measures to protect against cyanide impacts were incorporated into the mine design. The use of gravity and flotation methods to concentrate the ore prior to use of cyanide has greatly reduced the amount of cyanide used on site. Material exposed to the leach train will be treated in a cyanide destruction circuit prior to being introduced into the tailings thickener. The majority of the water will be removed in the tailings thickener and recycled to the mill. Cyanide will be complexed to a stable non-toxic ferric cyanide.

9. **Comment: Not everyone in Nome is of the same attitude and is not connected to mining activities or mining jobs, or wish to see additional gold mining. For some Nome persons subsistence is a very important aspect of living in Nome, and potential impacts to Nome subsistence uses must not be abridged.**

Response: Subsistence is an important aspect of living in Nome and there are no anticipated impacts to subsistence related to the Rock Creek Project. The Big Hurrah mitigation project is being proposed

as voluntary mitigation to enhance fisheries impacted by historical mining unrelated to Alaska Gold operations.

10. Comment: The following fish species are NOT characterized in the Rock Creek EID:

- At least three species of cod use the lower Snake River and lower Solomon River. They are Burbot, Saffron Cod, and Arctic Cod. Burbot exist in the Nome area, and are present in the Snake River and the Eldorado and Flambeau Rivers. They may also inhabit the lower portions of Solomon River.
- Dolly Varden and Arctic Grayling also inhabit the Snake River and Solomon River watershed. Dolly Varden may exist in their anadromous and non-anadromous variety. Solomon River is closed to any harvest of Arctic Grayling due to their low numbers.
- Rainbow smelt like the species of cod seasonally inhabit the lower Snake and Solomon Rivers.
- Slimy Sculpin inhabit most streams and rivers and are present in both watersheds and would be impacted within the projects sites as they would inhabit the upper portions more so than any other endemic species.
- Stickleback in nine spine variety inhabit the Snake and Solomon River watershed, three spine variety may exist in both systems and would also be directly impacted by both mines within the footprint of the project.
- Benthic macro invertebrates (BMI) are important for most of the fish species and since no inventory was conducted by Alaska Gold or Novagold an immediate assessment of the entire watershed potentially impacted by the project should be conducted to assess the BMI population as they are excellent indicators of water quality health and are food sources for fish and migratory birds.
- Red king crab an important subsistence resources is a species potentially within the influence of mining related impacts as their near shore presence could result in contact of toxic material.

Response: The applicant's proposal to maintain zero discharge during mine operations and meet the aquatic life water quality standards upon closure will ensure that these resources are fully protected.

11. Comment: Reindeer meat is a preferred traditional meat in our communities and herders provided a healthy product which is low in fat, high in protein and not contaminated by heavy metals. We want to continue to offer healthy red meat that is free of toxins. The reindeer herders would be negatively impacted, economically, if reindeer were found to be contaminated as a result of mining operations and people refused the meat.

Response: We do not anticipate any such problem resulting from the proposed project.

12. Comment: The Solomon River watershed provides subsistence opportunity to local users who fish that system or the adjacent marine waters for salmonids and other non-salmon species such as cod that mingle within the Safety Sound and Solomon Riverine Estuary. Although we appreciate that some mitigation effort will take place through the construction of fish pools, those pools will only be useful for over wintering habitat, which is a critical limiting factor for salmonids, if the ponds are sufficiently deep that they do not freeze to the bottom in winter. Also, it is essential to provide cover in the ponds in the form of structures sunk to the bottom and/or willows or other vegetation planted on the sides. Therefore, we recommend that the fish ponds proposed are built sufficiently deep enough, be supplied by a year-round spring and have adequate cover to allow for their use by juvenile salmon.

Response: Thank you for your comment. These suggestions will be considered when designing fish habitat improvements.

- 13. Comment: There are no specific dates indicated on the fish habitat permit as to when construction will take place. Many salmonids have moved into Nome area rivers by mid June and are spawning soon thereafter and continue at least until mid September. Construction during sensitive time periods may smother eggs and kill other aquatic lives that support salmonids.**

Response: The Fish Habitat Permit for the Big Hurrah Creek Mine Access Road and Culvert Installation states, "Construction will occur during periods when impacts to pink, chum, and coho salmon and Dolly Varden can be minimized."

SOCIOECONOMICS

- 1. Comment: The idea that NovaGold will provide jobs for locals seems misleading. My understanding is "local" can mean "Alaskan". The employees do not have to be from Nome if there is no one here qualified.**

Response: NovaGold has assured the public that they will do their utmost to provide jobs for the Nome community. Kawerak, Inc. Education, Employment and Training Division has worked with Nova Gold to create apprenticeship programs for Carpenters, Plumbers, Electricians, and Heavy Equipment Mechanics. They have been encouraged by Nova Gold's publicly expressed goals to train and support the work force they get, and to move them beyond entrance level jobs.

- 2. Comment: NovaGold should graciously provide land access across their "claims" that have been traditionally used. They should protect their property from vandalism. They should restore a gold dredge and make it into a mining museum for our visitors to explore safely.**

Response: Commenters have indicated that Alaska Gold has been considerate of people's desires to continue using the private lands that are now under Alaska Gold's control. However, Alaska Gold must provide site security to protect their property and limit public access to areas that are potentially unsafe for the general public. If someone wants to turn a historic gold dredge into a museum, that person should approach Alaska Gold Company with a specific proposal for them to evaluate.

DAM SAFETY/STABILITY

- 1. Comment: Tailings dam height is projected to be of minimum size. General applicability standards require maximum mitigation.**

Response: Please note that by minimizing certain aspects of the tailings storage facility (TSF), the maximum mitigation to the environment is obtained. Specifically, the area of the TSF and the size and height of the TSF dam were dramatically reduced by incorporating the "high density deep cone thickener" to produce "paste" tailings. In contrast, conventional slurry tailings would require a substantially larger TSF footprint and dam in order to manage the larger tailings volume and the resultant "supernatant" pond, which represents a substantially higher risk system.

In addition, because the stability of the dam is a function of the height and the side slope angle,

minimizing the height of the dam actually maximizes the stability of the dam as well as minimizes the disturbed area, also known as the footprint.

2. **Comment: Important aquatic life stages may potentially become exposed to acid mine drainage effects or free cyanide from metal cyanide complexes which may become weak acid dissociable and would pose a problem if the minimal height tailings dam were to fail.**

Response: The probability for a failure of the proposed TSF dam is low for the following reasons.

- a. The dam is a "downstream" construction, rockfill dam. No tailings will be used to construct the dam. The rockfill dam has been evaluated for static and seismic stability in accordance with Alaska dam safety guidelines.
- b. The paste tailings are inherently more stable compared to slurry tailings, with a respectively higher strength, further reducing the load on the TSF dam as well as reducing the potential for seepage from the system.
- c. The size of the TSF dam is designed to manage surface water inside the area bounded by the diversion ditches. Only a limited amount of water is expected to impound behind the dam on a temporary basis and will be consumed by the mill operation as soon as possible. Dry, average and wet years have been evaluated.
- d. A maximum operational water level will be specified in the TSF operations manual, providing additional storm surge capacity for an inflow design flood (IDF) selected in accordance with Alaska dam safety guidelines. In addition, freeboard is included in the design height of the dam above the combined volume of the maximum operational volume plus the volume of the IDF. This reduces the probability of an overtopping event by anticipating wind-induced waves or seismic deformation during the worst case storage condition, as well as providing additional emergency storage capacity under static conditions.

NOISE

1. **Comment: Test drilling for the road was audible up and down the valley when they had a single machine doing core samples for the road. It was possible to hear this for a long distance. I understand there will be blasting daily to dig the pit mine. Will there be restrictions on blasting on holidays or weekends?**

Response: The State of Alaska has limited authority to regulate noise. Regulating noise impacts is typically the role of local governments. If noise impacts become an issue for nearby residents, state agencies will work with the mining company to mitigate those impacts.