U.S. Environmental Protection Agency (EPA) Comments
Kensington Gold Project
Draft Supplemental Environmental Impact Statement (DSEIS)
April 2004

MAJOR COMMENTS

Total Suspended Solids

Significant uncertainty remains regarding the ability of the proposed tailings storage facility (TSF) to meet National Pollutant Discharge Elimination System (NPDES) effluent limits for total suspended solids (TSS). The applicant, Coeur Alaska, provided an analysis by Knight-Piesold that is referenced in Attachment 4 to Appendix A of the DSEIS that indicates the impoundment would have more than adequate volume and retention time for the tailings plume to settle and thus meet the 20 mg/l effluent limit. However, the formula used in the analysis is not applicable to the smallest 20% particle size fraction (less than 10 microns per Knight Piesold, citing British Columbia guidelines). Given that the coarser 40% of the tailings would be backfilled, this suggests that as much as one-third of the tailings discharged to the impoundment, or roughly 400 tons per day, would be within the particle size range that may not settle (See Attachment A).

The applicant and third party consultants have therefore searched for a comparable project that would provide some indication of how well a system like this might function in terms of settling out fine particles. None have been identified to date that we would consider comparable, although Benson Lake on Vancouver Island is cited in the Ecological Risk Assessment as a surrogate for looking at lake recovery after tailings deposition (Mine Environmental Neutral Drainage [MEND], 1991). While this report focuses more on lake ecosystem recovery seventeen years after tailings disposal ceased, it does have the following statement regarding settling performance during operation:

> *Throughout the period of operation of the mine, the lake consistently exhibited increased levels of turbidity caused by the finer colloidal fractions of the tailings remaining in suspension despite the addition of flocculants to enhance particle settling. Moreover, tailings fines were also found in the Lower Benson River below the lake's outlet.*

Likewise, in an earlier related report (MEND, 1990), it is stated:

> *Throughout the operation of the mine, the company experienced problems with lake turbidity caused by suspension of the finer colloidal fractions of the tailings.*

Our concern with the ability of the proposed discharge to meet TSS limits of 20 mg/l (daily average) and 30 mg/l (monthly maximum) is significantly heightened by the anticipated high flows, approaching 5,000 gallons per minute (gpm), that would need to be discharged. The average monthly flow during May, for example, is 3,201 gpm (DSEIS, Appendix A). Such high flows could well be beyond the capacity of a treatment system (e.g., media filtration) or the cost

of such treatment could be prohibitive.

For these reasons, we are pleased that the Forest Service agreed to conduct water quality modeling of the tailings discharge to provide another basis for evaluating the projected performance of the Lower Slate Lake tailings impoundment facility. Modeling of this nature is a standard tool for assessing potential water quality impacts from industrial effluent discharges. During the March 4, 2004 meeting, the Forest Service agreed to conduct modeling on the following for Lower Slate Lake: tailings discharge and distribution, tailing settling, and potential resuspension of tailings. This information will be particularly valuable for determining whether any contingency measures, such as water diversion or possibly treatment would likely be needed to assure compliance with NPDES effluent limits.

Operation of the Impoundment

At present it is unclear how Coeur proposes to operate the impoundment. The DSEIS (Figure 2-6) does not indicate how the effluent discharge would be decanted from the TSF. However, on page 2-24, the DSEIS states, "operationally, water would be pumped from a clear portion of the pond, away from the tailings discharge, to the spillway inlet for discharge." This should be made clear in the figures, showing the placement of the tailings pipeline relative to the pumped discharge point of withdrawal.

At a meeting in Juneau on February 25, 2004, a Coeur representative further indicated that incoming fresh water could be diverted around the impoundment through a pipeline rather than through a lines ditch (under Alternative C). This is new information that bears directly on the ability of the TSF to meet TSS limits and whether effluent flow could be reduced to levels more amenable to treatment if needed. It should be clearly described and the associated water quality and other environmental implications clearly analyzed and disclosed in the SEIS.

Another relatively new operational change presented in the DSEIS is the proposal to raise the level of the water in the TSF by approximately ten feet after tailings discharge ceases. This would address in part EPA's concern that the tailings discharge may not remain confined to the deeper portions of the TSF but could disperse widely and potentially cover the otherwise productive lake margins, heretofore assumed to be devoid of tailings. The implications of this new operational detail need to be considered in the SEIS. For instance, how long would it take to raise the lake level? How would downstream flow be assured if the flow from Upper Slate Lake is dedicated to raising the lake level?

Metals Loading Analysis

The DSEIS does not address our concerns regarding metals loadings from discharges from the TSF during operations, as compared to discharges from the dry tailings facility (DTF). Summaries of potential impacts of each alternative with respect to effluent quality, as portrayed in the table in the Summary (page S-8) and in Table 2-9, treat all alternatives as equals. Stating that the concentrations of pollutants would be similar does not consider the significant difference in flows from the DTF relative to the TSF and consequently the potentially significant difference

in metals loadings to the respective downstream environments.

We suggest the best way to disclose this information would be to calculate the incremental metals loading in the TSF discharge relative to current metal loads in the East Slate Creek discharge (at station SL-A). This information is readily available. This analysis should also distinguish metals loadings between alternatives B and C (see also comment below requesting a table similar to Table 4-11 for Alternative C).

Ecological Risk Assessment and Long-term Recovery of the TSF

The Ecological Risk Assessment concludes that the post-operation TSF will likely be as productive or more so than the existing Lower Slate Lake soon after closure and will improve through time. This conclusion is based on the assumption that the new lake margins that are not covered with tailings would support rooted aquatic plants and a benthic macroinvertebrate community at least as robust as what currently exists and that this area is as large or larger than the current productive lake margins. This conclusion also assumes that some colonization of the tailings will occur despite the poor performance of tailings subjected to freshwater bioassays (see comment below).

Table 5.3 in the Ecological Risk Assessment presents areas of zonation in the TSF compared to Lower Slate Lake based on bottom types. The text is careful to clarify that the area covered by tailings has the potential to support macroinvertebrates and aquatic plants based on light penetration. The text, however, then goes on to discuss the 'habitability' issues associated with the tailings even though there is a great deal of uncertainty (see comments below). Given the poor performance of the bioassays, concerns with how the Mine Environment Neutral Drainage (MEND) studies have been characterized (see comments below), and a lack of understanding regarding why the bioassays performed so poorly, it would be better for this table to either be deleted or altered to better reflect current uncertainties with applying bioassay results to the TSF. The temporal uncertainties relative to recovery also support portraying the tailings zone as unproductive for an unknown time frame. This would be more consistent with the findings of the DSEIS.

New information in the Ecological Risk Assessment regarding natural recovery is in error. The discussion on page 58 regarding presumed sedimentation rates in the TSF following closure states that about 2 cm/year of natural sediment would be expected to accumulate and that at such a rate 10 cm of natural substrate would cover the tailings within five years. These figures are based on recovery of Benson Lake on Vancouver Island into which reactive mine tailings were discharged from 1962 to 1974. The MEND reports (MEND 1991, 1990) regarding Benson lake, however, state quite clearly that 2-3 cm of natural substrate has accumulated on top of the tailings in total after 17 years of recovery. We also question the comparability of Benson Lake to Lower Slate Lake. Among other factors, it is situated in a much larger watershed with a much larger landscape and hence larger inflows capable of transporting sediment and organic debris. Parts of the watershed were apparently logged as well.

The inflow to Lower Slate Lake from Upper Slate Lake has a total suspended solids

loading of about 4 mg/l. The Ecological Risk Assessment should estimate the annual rate of sediment accumulation based on the actual rate of input and consider the TSS discharge out of Lower Slate Lake and identify how long would it take for 10 cm of natural sediment to accumulate.

The discussion of the MEND studies in the Ecological Risk Assessment needs to disclose both the comparability of the lakes that were monitored (for recovery after receiving reactive mine tailings) and the nature of the macroinvertebrate communities that were found. We are particularly concerned that in the oligotrophic Lower Slate Lake, which has apparently little input of sediment and organic material that there would be very little food source for aquatic organisms.

Moreover, the Benson Lake macroinvertebrate data showed significantly lower diversity, averaging only 8 taxa per site as opposed to an average of 30 in the control lake. Statements regarding the biota of Benson Lake (see p. 61, paragraph 3) should disclose this disparity in diversity between Benson lake and the control lake (MEND, 1991).

The discussion of the habitability of the tailings in section 5.2 needs improvement. Figure 5.1, for example, makes it appear that all endpoints are equal and with approximately half above and half below the "1" line, it is confusing to the reader. A summary table of the tests run and brief results would be useful. However, it must be stressed that not all endpoints are "equal". For example, #18 and 19 which refer to survival during bioaccumulation testing are not as important a finding as the amphipod bioassays. Macoma and Nereis are specifically selected as bioaccumulation test species because they are hardy and not expected to die during a 28 day exposure. See detailed comments on Appendix C below.

Dam Safety and Financial Assurances

Under Alternatives B and C, the existing lake will be enlarged in size from 20 acres to 56 acres and its height increased 90 feet by constructing a tailings dam. The DSEIS notes that the final water cover over tailings will be 20 feet and that the mine is located in an earthquake sensitive zone. EPA recommends that the DSEIS include assurances that the dam will be properly designed to withstand seismic activity and maintained throughout mine operations. Recent past experiences of similar methods have shown dam failures with coal slurry in Appalachia (see the Martin County coal case).

EPA also recommends that there be financial assurance in perpetuity to cover the costs of maintaining the dam's integrity after the mine ceases operations. Dam integrity and its related water cover must be kept in place because the cover stops chemical reactions from occurring within the tailings.

EPA recommends that a tailings dam trust fund be established at the beginning of mine operations and that trust fund have sufficient funds in it prior to the closure of mining to assure that either the state or federal authorities have access to funds to maintain the dam and are also able to fund emergency clean-up actions when required.

Reclamation and Closure

The DSEIS lacks significant information on reclamation and closure of Lower Slate Lake. EPA recommends that the final SEIS provide more details on how the lake would be reclaimed. For example, a listing of general types of flora and fauna expected to recolonize or be restocked in the lake (since new lake conditions most likely would not support the same type of life as it currently does) and information on the expected length of time anticipated for reclamation activities, both man-made and natural succession. This would provide the decision maker and public more information about the long-term environmental impacts.

Marine Resources

The DSEIS discusses marine species and recreation in Berners Bay. However, the DSEIS should provide a clear picture of the substantial value, productivity, and sensitivity of the area. The public is concerned that increased access to Berners Bay would alter recreation and resource values and change the character of the area. EPA recommends that the EIS include an introductory section explaining the valuable ecological and recreational resources and interconnectedness of habitat and fish and wildlife.

Berners Bay supports a diversity of sensitive and critical habitats important for birds, fish, and wildlife. The steep mountains and icefields ensure isolation of the area, which maintains its pristine and undeveloped character. The large glacially fed systems of the Lace and Antler Rivers drain into Berners Bay, depositing silts and sands forming extensive intertidal mudflats and estuaries. Along with Johnson and Slate Creeks, these rivers support a number of anadromous fish, including pink, chum, coho, sockeye salmon, and Dolly Varden char, cutthroat and steelhead trout. Estuaries, muskegs, and floodplains adjacent to these rivers are excellent spawning and rearing habitat for fish, as well as habitat for moose, bears, and waterfowl. Coastal old growth forests provide nesting habitat for bald eagles.

Estuaries at the mouth of anadromous streams are among the most sensitive habitats. Estuaries provide exceptional productivity as a result of the up-welling of nutrient rich deep waters from the Lynn Canal and the large volume of freshwater flowing from the upland drainage of the Lace, Berners, Antler, Sawmill Rivers. The nutrients then become available for use by phytoplankton, which provide food for fish, shellfish, and other marine organisms. Thus, estuaries provide the foundation of most marine food chains and the productivity of the offshore waters.

The estuarine wetlands are important for eulachon and other smelts which spawn in the Berners, Lace, and Antler rivers. Juvenile salmon, especially chum and pink salmon, migrate from the rivers to the estuaries soon after emerging from the spawning gravels during their out migration adjustments to saltwater.

Furthermore, Berners Bay provides important recreational values. Recreational activities include kayaking, hiking, camping, hunting, sport fishing, wildlife viewing, boating, etc., in an undisturbed pristine environment.

Herring in Berners Bay

EPA has concerns about the development of a marine ferry terminal at Cascade Point due to the potentially impacted herring spawning habitat. The herring population is depressed in Southeast Alaska, particularly at Cascade Point. The EIS states that there will be permanent loss of a small area of kelp habitat, which are crucial for herring spawning. Herring are an important food source for species such as the humpback whale and American Peregrine falcon, which are ESA listed species. EPA recommends avoiding construction at Cascade Point.

Cumulative Effects

EPA recommends that the SEIS include an expanded analysis and discussion of the potential cumulative impacts to Berners Bay. There are many actions/projects that are either proposed or reasonably foreseeable that could potentially result in the cumulative degradation of Berners Bay including the Juneau access road, an Echo Cove Master Plan by Goldbelt, Incorporated, and potential development of the Jualin Mine. EPA recommends an evaluation of transportation mechanisms that minimize cumulative environmental impacts and maximize the potential multiple use of access routes.

DETAILED COMMENTS

Page	Section	Comment
S-4		Alternative A1 states the life of the operation. Please add an additional sentence to the other three alternatives (Alternative A, B, and C) discussing the life of the operation.
S-6		Environmental Consequences, 1st bullet: What would be the height of the DTF associated with Alternatives A and A1? Why would the height of the DTF be the same under Alternative A1 given that the size would be approximately 65% smaller? What would the visual impacts be after reclamation and closure?
S-6		Environmental Consequences, 5th bullet: Please insert the word "affect" between "would 268".
S-8		Effluent Quality: EPA has not been provided convincing data indicating that effluent limits would be met for TSS under Alternatives B and C.
S-12		Socioeconomic Resources: Why would direct employment and payroll effects for Alternative A1 be the same as Alternative A when the mine life under Alternative A1 would be shorter?
S-13		Employee Transportation: Please clarify that the 2 to 4 trips associated with Alternatives A and A1 are helicopter trips.
1-4	1.2	Paragraph 3, 1st sentence: Please change "reduce the area of disturbance" to "reduce the area of *surface* disturbance". This clarifies the statement since subsurface aquatic disturbances are clearly increasing for Alternatives B and C.
1-6	1.5	Paragraph 2, 2nd sentence: It is stated here that the history of the Kensington Gold Project dates back to 1992 while page S-1 says 1990.
1-8	1.7.1	Paragraph 2, last sentence: This sentence directs readers to Section 3.12 for the Modified Landscape land use designation. Shouldn't this refer to Section 3.13?
1-9	1.7.1	Paragraph 1: The first sentence refers to the 2002 Amended Plan of Operations while page 1-3, 3rd paragraph, only discusses the 2001 plan.
2-3	Table 2-2	Footnote a indicates that the acreage figures do not include the disturbance associated with the docks at Cascade Point and Echo Cove, which begs the question of the size of disturbance associated with the respective docks.

2-3	Table 2-3	The size of the marine facilities associated with Alternatives B and C is 6 acres. Does this include the total disturbance for the docks at Cascade Point and Echo Cove?
2-3	Table 2-3	Footnote a: "bern" should be berm.
2-9	Figure 2-6 and 2-9	The pipeline, road, and location of lake discharge are not clearly shown. Please include a map that clearly illustrates Alternatives B and C, including labeling streams.
2-15		Again, please add an additional sentence to the three alternatives (Alternative A, B, and C) discussing the period of mining life.
2-16	2.2.4	Is Coeur still seeking an exemption from the regulatory requirement that process water must be recycled?
2-17	2.3.2	Paragraph 4, 4th sentence: Please add Alternative A1 to the sentence starting with, "Under Alternatives B and C..."
2-20	2.3.5	Subaqueous Tailings Disposal, Paragraph 2: Please provide the actual particle size range to define the size of the "small particles" being targeted by polymer and flocculant. Please also provide data to support the conclusion that polymer and flocculant would induce/enhance settling rates of the targeted size particles, and what specific flocculants and polymers would be used. This section should also describe the anticipated overall particle size composition for the slurry, prior to and after the addition of polymer and flocculant. Finally, please describe what measures the operator would employ to assure that the tailings remain on the bottom of the lake and would not disperse to cover the entire bottom area, including the shallow margins.
2-20	2.3.5	Subaqueous Tailings Disposal, Paragraph 3: Would the perforated pipeline be "above the bottom" of the TSF, or would it be maintained above the surface of the slurry? Also, what is the anticipated rate of tailings flow from the pipeline?
2-23		The contour lines are not labeled for the modified lake. Please label the contour lines to show the reviewer what the post closure lake elevation would be.
2-26	2.3.8	Paragraph 4: Should reference Figure 2-9, not Figure 2-8.
2-29	2.3.13	The Facility Response Plan (FRP) is mentioned in the list of EPA actions, but is not mentioned here for Alternative A although an Spill Prevention, Control and Countermeasures Plan is mentioned.

2-30	2.3.16	Figure 2-3 shows the borrow pits for Alternative A1, not B and C as stated. Alternative B's borrow pits are actually shown on Figures 2-4, 5, 6, and 7, while the borrow pits associated with Alternative C are shown on Figures 2-4, 7, 9, and 10.
2-32		The EIS should state the source of the fill material for the construction of marine ferry terminals.
2-34	2.3.19	Last 2 paragraphs: It states here that once the lake elevation is raised, the TSF would inundate "at least" the same acreage of natural sediments. After studying Figures 2-13 and 2-14, it appears that, in the process of doing this, the post-closure lake would support significantly more rooted plants than the original lake because of the much larger littoral zone compared to the original lake footprint. Is this the case? It also states that organic material will be added to encourage vegetation. Would the wetlands be manually planted with root plugs to stabilize the new littoral zone or would the area be allowed to re-vegetate naturally? This information should be provided. It says that reclamation would focus on restoring resident fish populations. This implies that multiple fish "populations" exist now. Pages 3-28 to 3-30 only focus on Dolly Varden char.
2-40	2.4.9	EPA does not agree with the second sentence. As mentioned above, significant uncertainty remains regarding the ability of the proposed project to meet effluent limits for total suspended solids (TSS). Short of a demonstration that TSS limits would be met in the effluent, a contingency for treatment should be provided and planned for in the event that effluent limits could not be met.
2-41	2.5.1	1st sentence: A contingency for effluent treatment should also be incorporated into the design.
2-43	Table 2-6	Water quality and hydrology: In addition to using BMPs to enhance settling in TSF, a contingency for treatment of the effluent should be incorporated into Alternatives B and C.
2-62		The DSEIS states in Table 2-9 under Alternative B that there will be permanent losses of production export values (high value). The DSEIS does not define this value nor discuss its importance to wetland functions. Please discuss further since there will be a permanent loss and it is rated as high value.
	Section 3	The header changes from "Chapter 3" to "Section 3"

3-30	3.9.2	Paragraph 2: There is detailed information on Dolly Varden char throughout the area, but only one sentence stating, "...three-spine stickleback have been captured in Lower Slate Lake." Need to expand on this topic. If resident fish populations are to be restored in Lower Slate Lake during the reclamation phase, some type of information on general numbers of stickleback in the lake is needed.
3-37		The DSEIS references the 1992 final EIS for a description of the biological communities in Lynn Canal. The 1992 final EIS is also referred to on other pages throughout the affected environment section. EPA believes that information should not be referenced in a document that is over ten years old. EPA recommends including any information related to the affected environment in this EIS.
3-83		The DSEIS states that most of Berners Bay viewshed is a Class B landscape, but that Cascade Point is rated Class A. The EIS should explain this rating system and discuss whether or not this classification directs any management for the area and if so, what the direction is for a Class B and A landscape.
4-9		The DSEIS does not fully disclose impacts to the stream diversion. It is difficult to assess whether the stream diversion would be less environmentally damaging or not. The EIS should more fully discuss the direct and indirect impacts, as well as the level of impacts caused by the diversion.
4-16	4.6.1	The first two full paragraphs are duplicates of each other. Paragraph 3: Please delete the word "and" from the sentence beginning with, "The current and NPDES permit provides..." This paragraph also references Appendix WQ, which appears regularly throughout the document as well as references to Appendix ERA (page 4-25). These appear to be references to Appendices A and C.
4-17	Table 4-9	This table does not contain the Sulfate and TDS limits for the permitted discharge. The permit has the AML and MDL equally set at 250 and 1000, respectively, and it is anticipated that this note will apply to Table 4-11 as well.
4-19	4.6.2	DTF Effluent Quality: Under Alternative A and A1, effluent from the DTF would be discharged to Camp Creek...
4-20		Last paragraph: Please add that the assumption is made that Alternative A1 would also meet water quality-based NPDES permit limits.
4-23	Table 4-11	Anticipated TSS effluent limits are missing from this table.

4-24	4.6.5	Paragraph 4: The sentence, "No model runs showed any conditions under which the water quality-based effluent limits would not be met." is awkward because of the double negative. Please reword for clarity. Please insert "be" between "would" and "covered" in the following sentence.
4-24	4.6.5	Paragraph 5: This paragraph needs to be revised in light of the discussions during the March 4, 2004 meeting in Seattle regarding TSS modeling, lack of dilution by lake inflows (or diversions as a contingency).
4-25		There are two sections 4.6.5. The second, related to water quality effects of alternative C, should be 4.6.6. This section should include a table comparable to Table 4-11 showing the anticipated effluent quality for Alternative C.
4-30		The DSEIS states that stream crossings could affect spawning and feeding behavior of anadromous fish populations. However, the DSEIS does not say what species of fish could be affected and to what degree. The EIS should state what species would be affected, if they are ESA listed or a species of concern, and to what degree they will be impacted.
4-31		Accidental Spills, Last paragraph: The discussion of probability is confusing. It says that 0.5% is 1 in 200 while 0.02 is 1 in 50. On the next page under Effects of Alternative A1, the discussion includes the percent, so 1.4% is about 1 in 70. A consistent way of labeling would be helpful.
4-33	4.9.3	Paragraph 3: This paragraph discusses the possibility of the channels of Mid-Lake East Fork Slate Creek being inundated. Is there a place that could be designated for upstream (natural condition sampling) that would not be inundated so the monitoring location would not have to be moved during the life of the permit?
4-39	4.10.1	Nearshore Marine Organisms, Spills: This discussion is referencing very outdated references. Several research/field studies conducted in the past ten years indicate that diesel entrained in intertidal and subtidal substrates is quickly removed in medium- and high-energy beaches and nearshore environments. Furthermore, lethal effects are only expected on the order of weeks, whereas sublethal effects would more likely occur over the following months.
4-39	4.10.1	Marine Mammals, Spills: Although pinnipeds seem to have a good avoidance behavior for oil spills, fur-bearing mammals that haul-out do not.

4-119	4.21.1	Extension of Mining Operations: Please also discuss how this relates to Alternative A1.
6-1	Section 6	References: There are numerous cases where multiple references of "same author/same year" are not properly listed or cited. Here is one example: there are two different references listed as USFS 1997; two different references listed as USFS 1997b; and one reference as USFS 1997c. In all, there are five USFS 1997 documents, which should be listed as 1997a thru e. Citations throughout the document will also need to be updated with correct year/letter.
7-1	Section 7	List of acronyms appears incomplete. Suggest adding: mg/L, ☞g/L, ND, °C, NM, ☞g/m^3
A-23	I	Last sentence: "Knight Diesold, 2002"
A-26	IV	The discussion of the study area precipitation is confusing. Is the precipitation at Eldred Rock 46.6 then you put in the orographic effect to get the project area precipitation of 58.3?
A-30		Last paragraph, 7^{th} sentence: "digestion used in digestion used in..."
A-49		Why is the text at the top of the page italicized?
A-60		Sulfate/TDS: The previous permit uses 250 and 1000 as the average and the max.
C-4&5	Figures 1.2 & 1.3	The dotted portions in the key for Fig. 1.2 do not give any information. Shouldn't the plants, inverts and fish zone be different from the inverts and fish zone? Most importantly, Figs 1.2 and 1.3 are still difficult to compare to one another given their different labeling, orientation, etc. Please add a new figure just like Figure 1.3 but note the BEFORE project zones. Include depth definition in parentheses in the key to the figure, i.e., "rooted plants (<13 feet deep)". Figure 1.2 needs a quantification on descriptors such as productivity, unless this figure is meant to indicate the final desired condition of the lake. Please also include photos of the lake margins and vicinity.
C-6		Last paragraph, 1^{st} sentence: Should "evaluation" be "elevation"?

C-11 &12	2.2	The end of section 2.2 is confusing. It starts with Kline's statement that everything is OK then gives a list of results. It should do a better job of summarizing the results (or point to Table 5.4 that has the same detail in more digestible format). This section would be improved if stated that most of the bioassays passed and then listed the ones that did not and the influence on recolonization (which is the point of this section on stressor/contaminant characteristics).
C-13	Figure 2.2	The conceptual model should include discharging ground water as a mechanism for transporting the interstitial water of the tailings upward into the biotic zone. Certainly this mechanism should be discussed in the SEIS if there are any assumptions made about process water staying with tailings as they are deposited or interstitial water not being bioavailable. The influence of discharging GW should be discussed in sections 4.3.1.3. & 4.3.2.3, Post-Closure Water.
C-20	Table 2.2	Table 2.2 should mention the toxicity test results in the measurement endpoint column and also in the interpretation column (right now they appear subsumed under "Evaluation of recolonization/habitability of tailings". Similarly, there is no indication of toxicity in Table 5.1.
C-28		Correct spelling of the marine polychaete is: Nereis virens (v. Neries). Same comment for page C-55.
C-48 to 50	5.1	Edit the discussion on chemical stressors to indicate that some bioassay lab results are more equivocal than currently indicated in the text. Rhepox and Neanthes more supportive than the Ampelisca (EVS) and Hyalella. The bioassays are important integrators of the various tailings constituents, including the process water. This is valuable information that complements the comparison to literature values on a metal by metal basis.
C-55 thru 58		EPA agrees that the results for Initial and Retest #2 for Ampelisca should be dropped due to poor performance in the control and reference. However, in this narrative the discussion of Ampelisca (lab marine invert) results should indicate that Retest #1 for Ampelisca also showed "mixed results" relative to reference/control, therefore the statement "...both laboratory and field tests indicated that the tailings were as habitable as the native Lynn Canal and Auke Bay sediments" is not true. Retest #1 should be retained as the performance of the Lynn Canal and control sediments were close to or above 80%. Tailings survival was 39% in that test.

C-58	5.2.2	Second paragraph, first sentence should read: "The results of the freshwater *and Ampelisca marine amphipod bioassay* indicate that there are possible limitations to the ultimate habitability...". The uncertainty issues related to the ultimate habitability and length of time to reach habitability should be mentioned here and clearly discussed in the uncertainty section as well. "Possible physical limitations *could eventually* be overcome with *enough* allochthonous inputs...". The Benson Lake references should be changed as discussed in the preceding general comments and actual likely inputs specific to the Lower Slate Lake scenario discussed here.
	Table 5.5	Physical Effects. For goal #1 of reestablishing Dolly Varden char, the results summary statements are not supported by the text and situation in the lake itself immediately after closure. "Forage availability should not be limiting" is not proven in the discussion, and certainly a time frame is required here. Are we implying that the tray tests in an active marine environment provides insight on the recovery time for a lake completely covered by tailings (except for the margins)? "Productivity in LSL should be similar to existing conditions soon after closure and will improve over time". This statement also is not supported by the narrative. What about time frame? What about inputs of material?
C-59	5.2.3	3rd line, remove "likely". 5th line change undisturbed to "recently inundated".
C-59	5.2.3	2nd paragraph. Change "While the area associated..." to "While the inundated acreage associated with natural sediment for benthic invertebrates would be the same for the TSF and the existing LSL..." Change the discussion on p. 59 same paragraph to be specific to inputs expected in LSL not Benson Lake (MEND).
C-61		Provide the benthic information specific to Benson Lake comparing the control and Benson Lake data. Were the communities the same in terms of diversity and species before and after the tailings were placed and compared to the control? Are Chironomids and Amphipods present?

References

MEND (Mine Environment Neutral Drainage), 1991, *A Preliminary Biological and Geological Assessment of Subaqueous Tailings Disposal in Benson Lake, British Columbia*, March 1991

MEND (Mine Environment Neutral Drainage), 1990, *A Preliminary Assessment of Subaqueous Tailings Disposal in Benson Lake, British Columbia*, March 1990

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 17 2004

OFFICE OF
WATER

MEMORANDUM

SUBJECT: Clean Water Act Regulation of Mine Tailings

FROM: Diane Regas
Director, Office of Wetlands, Oceans and Watersheds

James A. Hanlon
Director, Office of Wastewater Management

Geoffrey H. Grubbs
Director, Office of Science and Technology

TO: Randy Smith
Director, Office of Water, Region X

Thank you for your recent inquiry regarding the Clean Water Act (CWA) regulation of activities in waters of the United States associated with hard rock mining in Alaska and, more specifically, discharges of mine tailings from the proposed Kensington Mine. Your questions focus on the applicability of CWA sections 404 and 402 to the placement of mine tailings in impounded waters of the United States.

We have coordinated this matter with your staff in Region X and the Alaska Operations office, several offices within EPA Headquarters, and officials at the Headquarters and Alaska District offices of the Army Corps of Engineers (Corps). This memorandum serves to provide the clarification Region X and the Alaska District are seeking with regard to this issue. This memorandum describes a regulatory framework and how it applies to a general set of facts.[1] It

[1]While these questions have arisen in the context of a revised proposal being considered for the Kensington mine project, the regulatory approach outlined in this memorandum is generally applicable to other comparable mining proposals. The Kensington proposal, as we understand it, would involve the construction of a dam to impound the waters of Slate Creek and Lower Slate Lake and the placement of gold mine tailings into the impoundment created in Lower Slate Lake pursuant to an individual 404 permit and a subsequent discharge from the impoundment back to Slate Creek waters. The determination of which CWA permitting program applies to a particular discharge of mine tailings is fact-dependent

does not represent decisions about the suitability of a permit for any particular project.

EPA and the Corps agree that the discharge of fill material to construct the dam for a tailings impoundment as well as the discharge of the mine tailings into the impoundment is subject to permitting under CWA section 404, which governs the discharge of dredged or fill material. EPA and the Corps also agree that any discharge of pollutants from the impoundment to a downstream water (such as Slate Creek in the Kensington project) is subject to CWA Section 402, the National Pollutant Discharge Elimination System (NPDES) program. This discharge from the impoundment, like any discharge needing an NPDES permit, is subject to effluent limitations based on technology-based standards (e.g., any applicable effluent guidelines such as 40 C.F.R. Part 440) and any more stringent limits needed to comply with state water quality standards.

2002 Rulemaking Defining "Fill Material" and "Discharge of Fill Material"

Under section 404 of the CWA, the Corps (or an authorized State) issues permits for discharges of dredged or fill material into waters of the United States. Discharges of all other pollutants into waters of the U.S. are subject to permits issued by EPA (or authorized States) under the NPDES program. To bring greater clarity and consistency to how EPA and the Corps regulate discharges of pollutants, the agencies recently revised their regulatory definitions of "fill material" and "discharge of fill material." 67 Fed. Reg. 31129 (May 9, 2002). The regulations now define "fill material" as material placed in waters of the U.S. where the material has the effect of either replacing any portion of a water of the U.S. with dry land or changing the bottom elevation of any portion of the water. 67 Fed. Reg. 31130; see also 40 C.F.R. §232.2, 33 C.F.R. §323.2(e). Examples of fill material, as defined by the regulations, include overburden from mining and materials used to create any structure or infrastructure in waters of the United States. Similarly, the phrase "placement of overburden, slurry, tailings or similar mine-related materials" was added to the definition of "discharge of fill material" to provide further clarification as to the type of activities generally regulated under section 404. See 40 C.F.R. §232.2; 33 C.F.R. §323.2(f).

We believe that the text of the rule makes clear that mine tailings placed into impounded waters of the U.S., as proposed by the Kensington mine project, are regulated under section 404 of the CWA as a discharge of fill material, and that effluent discharged from the impoundment to a downstream water, such as Slate Creek is covered by section 402. Mine tailings placed into the proposed impoundment will have the immediate effect of filling the areas of water into which

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and, in part, turns on the effect of the particular discharge on the receiving waterbody in question. This memorandum is specific to impoundments and thus our analysis today focuses solely on the discharge of mine tailings into impoundments designed to hold such materials. Any other type of proposed project, such as open water disposal of mine tailings or any other similar materials, would be subject to a different regulatory analysis.

they are discharged and therefore fall within the scope of section 404. As a result, the regulatory regime applicable to discharges under section 402, including effluent limitations guidelines and standards, such as those applicable to gold ore mining (see 40 C.F.R. Part 440, Subpart J), do not apply to the placement of tailings into the proposed impoundment. See 40 C.F.R. §122.3(b). This result is confirmed by the preamble to the rule which explained the dividing line between section 402 discharges and section 404 discharges by noting that EPA would continue to regulate under section 402 "discharges (such as suspended or settleable solids) [that] can have the associated effect, over time, of raising the bottom elevation of a water due to settling of waterborne pollutants." 67 Fed. Reg. 31135. Here, the effluent discharged from the impoundment into Slate Creek will contain pollutants in the form of suspended and settleable solids, materials that will have, at most, an incidental filling effect. The addition of those pollutants to the Creek from this impoundment associated with an industrial operation would therefore be subject to regulation under section 402.

In sum, under both the plain language of the rule and the Agencies' interpretation of the regulation in its preamble, the mine tailings that are to be placed into an impoundment are covered by section 404 and effluent discharges from the impoundment into a receiving water are subject to permitting under section 402.

The Waste Treatment Exclusion

In 1992, EPA and the Corps were approached to address CWA regulation of the Kensington project, as then proposed, and a related mining proposal, the A-J Mine. Under the approach articulated in the 1992 memorandum from then EPA Assistant Administrator LaJuana Wilcher to the Region's Water Director Charles Findley regarding the A-J and Kensington proposals, issuance of a section 404 permit for the impoundment of waters for mine tailings would, under certain circumstances, create a waste treatment system that was excluded from the regulatory definition of "waters of the United States." In those circumstances, neither a section 404 permit nor a section 402 permit would be required to discharge tailings into the treatment system. A section 402 permit would be needed for any discharge of pollutants from the treatment system into waters of the United States. The 1992 memorandum provided that, as part of the analysis required under the section 404(b)(1) Guidelines, the physical impacts of the discharge of mine tailings into the system also would be considered.

The 1992 memorandum, however, was developed to clarify the regulatory approach to discharges of mine tailings in light of the Corps' and EPA's then differing definitions of "fill material" and "discharge of fill material." Our current analysis of how the 2002 rulemaking applies to the permitting of discharges of mine tailings into impounded waters will help to ensure a more effective environmental review of any adverse impacts associated with these types of projects. The rulemaking did not, however, alter EPA's interpretation of the waste treatment exclusion contained in 40 C.F.R. §122.2. While the permitting framework described in this memorandum does not invoke the exclusion for the discharge of mine tailings to impounded waters, neither does it preclude its use for waste treatment systems or system components that meet the definition in 40 C.F.R. §122.2.

Applicability of State Water Quality Standards

You also have asked how water quality standards would apply to the permitting of this project under section 404. The regulatory approach articulated in this memorandum does not alter the manner in which water quality standards currently apply under section 404 of the CWA or, in particular, how they would apply to the Kensington proposal.

With regard to the Kensington Mine project, we understand that the company's current proposal would result in a tailings pile behind the dam that is some 54 feet above the current water level in Slate Lake and, in the process, result in filling the entire Lake.[2] In addition to the analysis of the availability of upland alternatives, the Corps' environmental review of the project under the section 404(b)(1) Guidelines must specifically consider compliance with water quality standards and the chemical, physical, and biological impacts associated with the proposed conversion of waters to non-waters that are contemplated to result from the discharge of fill material. Before a section 404 permit may be issued, the Corps must conclude, among other determinations, that the proposed project would not cause or contribute to significant degradation after all practicable steps have been taken to avoid and minimize environmental impacts and to mitigate for remaining adverse aquatic impacts.

In addition, under the Guidelines, "no discharge of dredged or fill material may be permitted if it causes or contributes, after consideration of disposal site dilution and dispersion, to violations of any applicable State water quality standard." 40 C.F.R. §230.10(b)(1). In circumstances like the proposed Kensington mine, the Guidelines do not require that the proposed discharges comply with water quality criteria within the impoundment since the impoundment is the "disposal site" proposed to be authorized to be filled under the Corps' section 404 permit. The regulations define "disposal site" as "that portion of the 'waters of the United States' where specific disposal activities are permitted and consist [sic] of the bottom surface area and any overlying volume of water." 40 C.F.R. §230.3(i).

In this particular case, because the entire lake is proposed to be within the permitted disposal site specified under section 404(a), the section 404(b)(1) Guidelines require the Corps to consider, during the permitting process, whether the discharge of fill material would cause or contribute to a violation of water quality criteria or impairment to designated uses in the adjacent waters of Slate Creek (i.e., waters outside the impoundment). The State, in making decisions with regard to water quality certification, determines whether the project would cause or contribute to a violation of water quality standards, at a minimum, in waters upstream or downstream (outside) of the disposal site, considering, among other factors, whether future discharges from the impoundment to downstream waters will meet discharge limits that assure

[2]Additionally, we understand that there may be some water on top of the disposal site after the conclusion of the permitted activity. Any determination by the government to reassert CWA jurisdiction over this water would generally not occur until after site reclamation has been completed consistent with an approved mine reclamation plan.

compliance with applicable downstream water quality standards.[3]

State water quality standards also include antidegradation policies consistent with 40 C.F.R. §131.12. EPA interprets section 131.12(a)(1) of the federal requirements for antidegradation policies to be satisfied with regard to fills in waters if the discharge will not result in "significant degradation" as defined under section 230.10(c) of the section 404(b)(1) Guidelines. See Water Quality Standards Handbook, 2d Ed. (U.S. EPA Aug. 1994), at 4-5. Accordingly, unless a state indicates otherwise, a discharge of fill material which complies with the "no significant degradation" requirement of the Guidelines would be considered also to satisfy the "existing uses" requirement of the state's antidegradation policy.

I appreciate the assistance you and your staff have provided on this matter. I trust that the information provided in this memorandum meets your needs. Should you have any additional questions, please contact me or have your staff contact John Meagher at 202-566-1353.

cc: Major General Strock
Director of Civil Works

[3]States retain the authority to adopt use designations for waters that prohibit or substantially restrict discharges into certain waters, such as outstanding natural resource waters (see 40 C.F.R. §131.12(b)(3)) and to protect those uses through the exercise of their certification authority.