



**UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration**

National Marine Fisheries Service

P.O. Box 21668

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September 22, 2006

Anne Currie
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British Columbia Environmental Assessment Office
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Dear Ms. Currie:

The National Marine Fisheries Service (NMFS) reviewed the Galore Creek Project *Application for Environmental Assessment Certificate* (Application), dated June 2006, prepared by Rescan Environmental Services Ltd for NovaGold Canada Inc. NMFS review focused on elements of the Application related to living marine resources that are of concern to NMFS, including anadromous fish and potential downstream water quality impacts to the Stikine River.

The proposed Galore Creek copper-gold-silver mining project is in a remote area in northwestern British Columbia approximately 90 KM northwest of Wrangell, Alaska. The mine is located in the Galore Creek drainage. Galore Creek is a tributary to the Scud River, which is a tributary to the Stikine River. The project will be accessed by a 128 KM access road (from Highway 37) and 3.8 KM tunnel. According to the current plan the site will produce 5.9 billion pounds of copper, 3.7 million ounces of gold and 40 million ounces of silver over the 20-year life of the mine. The project will be an open pit mine (5 open pits are planned) and process approximately 65,000 tons of ore per day in a conventional mill. Ore concentrate will be pumped to a filter plant through a 140 KM pipeline. Residual materials will be removed and placed in a tailings impoundment located behind a cross valley dam in the Galore Creek Valley. A large tailings dam (30 meter wide crest and 1.1 KM wide base) will contain the tailings. Approximately 500 million tons of tailings are expected to be produced over the 20-year life of the mine. The mine is expected to generate a total of 1,016 million tons of waste rock. Nova Gold has determined that the most effective alternative for disposal of waste rock is to store all reactive and potentially reactive waste rock under water and the rest in sub-aerial dumps adjacent to the tailings impoundment. The dam constructed to create the tailings impoundment will flood a large enough area to accommodate all of the reactive and potentially reactive waste rock.

NMFS supports the identification of Valued Ecosystem Components (VECs) and evaluating potential environmental effects on these components. We are pleased that the Stikine River is included as a VEC.

NMFS is generally satisfied with the description of the project, analysis of effects, and plans during construction and operation. We are concerned with the lack of specific



information on post closure monitoring and management and actions that would be taken in case of a catastrophic event or if planning assumptions are not met (i.e. if submerged tailings and waste rock generate acid. Our technical comments are enclosed.

NMFS appreciates the opportunity to review and comment on the Application and to participate in the working groups. Please contact Cindy Hartmann at 907 586-7585 or cindy.hartmann@noaa.gov if you have any questions or for further coordination.

Sincerely,



Robert D. Mecum
Acting Administrator, Alaska Region

Enclosure

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Galore Creek Project Application for Environmental Assessment Certificate
U.S. Department of Commerce, National Marine Fisheries Service
Section Specific Comments
September 22, 2006

NMFS Specific Comments on the Galore Creek Mine Application

Volume I, Section 2.4.1, Trans-Boundary Management, fourth full paragraph. To more accurately reflect this baseline sampling work, we recommend that this sentence be revised to read: "At the request of U.S. Federal and Alaska State agency representatives, a number of baseline water, sediment, and fish community samples have been collected. This includes samples taken at 1 location downstream of the confluence of the Stikine-Iskut Rivers in Canada, and at 2 locations in the Stikine River in Alaska. The purpose of the sampling and resulting analysis is to help assist future analyses of project-related effects on Alaska-based fishery and wildlife resources."

Volume I, Section 5.5.1.1, Pit Slope Stability, page 5-83. This section states that both vertical and horizontal dewatering wells and drains will be installed in the pit as part of mining operations. It is unclear, if during mine operations, water from these wells and drains will be routed to the water treatment plant before release. Figure 8.3-7 (in Volume III, Section 5.5.1.1) shows a connection of these water sources to the treatment plant, however we could not find supporting text narrative on this plan. In addition, it is unclear whether after mine closure, these wells and drains will be plugged, since the water treatment plant will no longer be in existence. We are concerned with maintenance of water quality post-closure and detection of any increase of trace metals above water quality standards due to their potential effects to downstream salmonid fisheries. Therefore, we recommend appropriate narrative be included in the Application to address the operation and close-out of dewatering wells and drains.

Volume I, Section 6.5.2.5, Stikine River, Table 6.5-6 and page 6-51. The third paragraph refers to baseline parameters exceeding water quality guidelines and references Table 6.5-6. The data in Table 6.5-6 is collapsed. This section should also reference where the reader can find the data specific to each sampling site.

The 4th paragraph states: "At the one stream reference site, the following parameters..." We assume that this is Stik-1. It would be useful to identify the specific site in the narrative and/or identify Stik-1 as a reference site in Figure 6.5-9.

Volume III, Section 9.3.2.6, Mitigation and Monitoring, page 9-25. This section states that "Guidelines that were created to be protective for all water bodies in Canada do not necessarily consider the specific environmental conditions of the aquatic ecosystems in Galore Creek and the Scud and Iskut rivers. Therefore, site-specific water quality objects (WQOs) for specific contaminants of concern (Section 7.6) will need to be developed during the permitting process to provide relevant benchmarks for the aquatic effects

monitoring program." Since juvenile coho were captured within 1 KM of the mouth of Galore Creek (Volume I, page 6-110) we recommend setting copper concentrations below those found to cause olfactory problems in juvenile salmon as reported by Baldwin, DH, et al., 2003. Sublethal effects of copper on coho salmon: impacts on nonoverlapping receptor pathways in the peripheral olfactory nervous system. *Environ. Toxicology and Chemistry* 22:2266-2274.

Volume III, Section 8.4.10 Summary of Closure Concepts, page 8-67. This section states that after closure it is assumed that the impoundment water chemistry will be suitable for direct discharge to the environment and water exiting the spillway will be released without collection and treatment. NMFS has concerns with post closure monitoring and assurance that water quality standards will be met post closure. What specific actions will be taken post closure to test the water flowing over the dam, in the spillway, and seepage from the dam to empirically test assumptions? If assumptions are not met what will be done?

Volume III, Section 10.5.4, Monitoring Habitat Loss, Change and Reclamation. This section states that "An Environmental Effects Monitoring (EEM) program will be established as a requirement of the permits and licenses under which the Galore Creek Mine will operate." Table 10.6-1 identifies the locations and frequency of sampling for the aquatic effects monitoring program. The monitoring program currently lists only one exposure location on the Stikine River (STIK-2 immediately below the confluence of the Scud and Stikine River).

NMFS recommends including additional Stikine River downstream locations during the construction, operation, closure, and post-closure phases. This data would provide additional data points to evaluate potential cumulative and long term effects. The Application stated that some of the rocks at Galore Creek are potentially acid generating over long time scales and that there is expected to be a delay between time of exposure and onset of acid rock drainage (conservatively estimated to be greater than 22 years – page 5-35). The Application also identified projects that may be developed in the geographic area including: Red Chris, Mount Klappan Coal Project, Kutcho Creek, and Schaft Creek. NMFS would appreciate the opportunity to discuss and/or review proposals to include additional Stikine River monitoring locations during the construction, operation, closure, and post-closure phases.

Volume III, Section 14.4.1.4, Tailings and Waste Rock Containment Facility, page 14-37. According to this section, the tailings and waste rock containment facility will have a permanent water cover that is anticipated to have water chemistry suitable for discharge to the downstream receiving environment. Because excess water will be passively released without collection and treatment, we recommend that long-term water quality monitoring include the release waters from the tailings impoundment. If these waters acidify over time, dissolved metals would be released into downstream waters. Monitoring will help ensure that all release water meets applicable water quality standards in order to protect downstream fisheries.

Volume III, Section 14.8, Post Closure Monitoring, page 14-39. Only two sentences and four bullets describe post closure monitoring. It states “Post-closure monitoring will be conducted within the project area to ensure closure and associated reclamation efforts remain effective in the longer term.” How long is the “longer term”? Who will develop this long term monitoring plan? Will U.S. agencies have an opportunity to review and comment on the post-closure long term monitoring plan? What will be the frequency and duration of water quality monitoring for the tailings effluent, spillway, below dam seepage, groundwater, pit waters, and road corridor after closure? Will there be long term monitoring in the Skud and Stikine Rivers? With the closure of all easy access to Galore Creek due to closure of the road and tunnel, how will a problem be taken care of in a timely fashion?

Polycyclic Aromatic Hydrocarbons (PAHs) Baseline Sampling

NMFS recommends monitoring of polycyclic aromatic hydrocarbons (PAHs) in addition to the proposed water quality monitoring. Because of the potential for PAH deposition (from spills, pipeline leaks, and motor vehicle exhaust) during construction and operation of the mine it is important to include PAHs in water and sediment sampling to monitor PAH conditions. Samples could be taken in Porcupine, Sphaler, or More Creek, in the Scud and Iskut River, and in reference sites. NMFS recommends passive sampling with a semi permeable membrane device (SPMD) as a low-cost alternative to tissue sampling. One time analysis of water samples for PAH are unlikely to reproduce the bioaccumulation associated with chronic exposure to these carcinogenic and mutagenic compounds. The proven ability of devices such as SPMDs to concentrate trace quantities from the water and integrate exposure over time improves the detection of PAHs and permits capture of intermittent pulses of contaminants (Moles et. al. 2006).

References

Moles, Adam, Larry Holland, and Ole Andersson. 2006. Assessment of the significance of direct and indirect pollution inputs to a major salmon-producing river using polyethylene membrane devices. *Environmental Toxicology and Chemistry* 25(8): 2011-2017
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