



Giant Mine Environmental Assessment

IR Response

Round One: Information Request – Yellowknives Dene First Nation #13

May 31 2011

INFORMATION REQUEST RESPONSE

EA No: 0809-001

Information Request No: YKDFN #13

Date Received:

February 28 2011

Linkage to Other IRs:

Date of this Response:

May 31 2011

Request

Preamble:

The Canadian Water Quality Guidelines (CWQG'S) for the protection of Freshwater Aquatic Life (FAL) were recommended as the most appropriate criteria for assessing the geochemistry surface water quality data. It was indicated that surface water quality in Baker Creek would not meet the CWQG-FAL for some contaminants (e.g., arsenic). Section 6.9.3 of the DAR outlines a set of proposed remediation activities for Baker Creek, which included rerouting portions of the creek and the capping and/or removal of contaminant tailings and sediments. It was indicated that the evaluation of the proposed remediation activities at Baker Creek will require a process of public consultation where input will be seek community preferences for the implementation of rehabilitation activities in Baker Creek.

A risk assessment of the post remediation environment in Baker Creek predicted surface water concentrations of 188 mg/L which are above the CCME water quality guideline of 5 µg/L. It was stated that the predicted arsenic surface water concentration may result in potential adverse effects to fish in Baker Creek. The risk assessment considered that sediment in Baker Lake would be removed and some sections of Baker Creek would be realigned. The results of the risk assessment indicated that further clean up of sediments would reduce the risk to fish habitat in Baker Creek. In Section 14.2.2.4 *Surface Water Monitoring* it was stated that the monitoring of health of benthic fish communities will provide the best measure of long-term effects of the remediated Giant Mine site.

Question:

It is requested that surface water quality guidelines are adopted to assess the performance of remediation activities at the Giant Mine site. The Canadian Water Quality Guidelines (CWQG'S) for the protection of Freshwater Aquatic Life (FAL) could be adopted as surface water quality guidelines. Specific to the Baker Creek it is requested that monitoring activities are outlined to assess the performance of the proposed remediation activities in Baker Creek. Monitoring activities should be outlined in the planned public consultation process.





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Reference to DAR (relevant DAR Sections):

S.6.9.3 Remediation of Baker Creek

Summary

Due to the heavy influence of upstream sources on arsenic concentrations within Baker Creek, the Canadian water quality guideline for protection of freshwater aquatic life of 5 µg/L for arsenic is not achievable. Although this criterion cannot be met in Baker Creek, based on current use of the habitat by aquatic species (e.g., Arctic grayling) significant adverse effects are not anticipated. This will be verified through investigations into the health of aquatic biota following completion of remediation. The arsenic level in Yellowknife Bay by contrast is expected to remain below the water quality guideline for protection of aquatic life.

Response

To be correct, the predicted arsenic concentration at the mouth of Baker Creek (i.e. downstream of the Giant Mine site) following remediation is 118 µg/L (per Table 8.4.4 of the Developer's Assessment Report (DAR)). This concentration was estimated from a total arsenic load of 480 kg/year of which 220 kg/year comes from upstream of the Giant Mine site and 67 kg/year is associated with other offsite tributaries (per Table 8.4.3 of the DAR). In other words, approximately 60% of the total mean annual arsenic load comes from areas that will not be affected by remediation activities.

The contribution of these offsite sources accounts for approximately 70 µg/L of the predicted 118 µg/L total arsenic concentration at the mouth of Baker Creek. The remaining 48 µg/L is attributable to surface runoff from the Giant Mine site. While an allowance was made in the assessment for some reduction in the arsenic load input to Baker Creek from the remediated site (i.e., from 220 kg/year currently to 190 kg/year in the post-remediation phase per Table 8.4.3 of the DAR), a conservative approach was taken in assessing the effectiveness of remediation activities.

While it is expected that the Canadian water quality guideline for protection of freshwater aquatic life of 5 µg/L for arsenic will be met consistently in Yellowknife Bay, it is not a reasonable target to set for Baker Creek, as it is simply not achievable. Rather, it is proposed that monitoring of the recovery of Baker Creek be based on field investigation of the health of aquatic biota, similar to the monitoring that was carried out on Reach 4 of Baker Creek following realignment in 2006. As discussed in Section 7.4.3.5 of the DAR, utilization of Reach 4 by Arctic grayling and other species has been shown to be successful in improving spawning habitat. Likewise, the results of environmental effects monitoring (EEM) work on Baker Creek has shown some differences in the health of fish taken from the creek versus fish taken from an unaffected reference area, with the condition factor being higher for sentinel species in the exposure (i.e., Baker Creek). The condition factor (i.e., a measure of energy storage) is one of several measures used in biological investigations to assess the health of fish. It is the Giant Mine Remediation Project Team's position that this type of monitoring will provide much more useful insight into the recovery and health of Baker Creek as opposed to adopting an arbitrary arsenic concentration target that may not be achievable. The Project Team commits to consultation with interested parties on the Baker Creek remediation plan as discussed in responses to other information requests (e.g. Review





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Board #18). INAC also supports the current ban on fishing for consumption and believes that the catch and release advisory should remain in effect until such time as fish monitoring data indicates fish caught in Baker Creek are safe to eat.

