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Bruce Morgan
Canadian Environmental Assessment Agency
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Dear Mr. Morgan:

The Canadian Environmental Assessment Agency (CEA Agency) has asked federal departments for their views on whether the New Prosperity project description, taking into account the implementation of appropriate mitigation measures, may result in significant adverse environmental effects on elements of the environment on the basis of either management responsibility or technical expertise.

In responding to the Agency's request, Natural Resources Canada (NRCan) reviewers examined Taseko Mines Limited – New Prosperity Gold-Copper Project – Project Description, August 2011. The focus of the review for NRCan is the potential environmental effects related to the New Prosperity Gold-Copper Project-Project within the fields of hydrogeology, hydrogeochemistry, metal leaching and acid rock drainage.

Context

The environmental impacts of the original Prosperity Mine project were assessed by a Federal Review Panel (FRP), and the end of which the FRP issues its final report, concluding that: "*the project would result in significant adverse environmental effects on fish and fish habitat, on navigation, on the current use of lands and resources for traditional purposes by First Nations and on cultural heritage, and on certain potential or established Aboriginal rights or Title*". On November 2, 2010, the Government of Canada determined that these significant adverse effects could not be justified as proposed.

Of particular relevance for NRCan in the review of the 2011 Project Description, is that, during this previous environmental assessment three alternative mine development plans (MDPs) were evaluated. Option 3, involving the destruction of Fish Lake and the creation of a 17 km² Tailings Storage Facility (TSF) was the proponent's preferred MDP at the time. However, MDP Option 2, which was rejected by the proponent at the time on the basis of economic and operational considerations, is similar to the New Prosperity MDP.

Canada

Hydrogeology and Hydrogeochemistry

In comparison with the previous mine development proposal, Fish Lake is maintained by relocating non-potentially acid generating (PAG) overburden and waste rock piles to the north-east of the pit and by pushing back the main embankment of the TSF 2 km south of Fish Lake, to the Upper Fish Creek basin. The revised TSF will have a smaller footprint of 12 km² and correspondingly higher embankments in order to accommodate the same volume of tailings and PAG waste rock as the original design. In addition to the Main and West embankments of the original design, the revised TSF will require a South embankment above Wasp Lake and the Beece Creek catchment.

The New Prosperity MDP does not change potential groundwater issues associated with the original design while it creates additional issues of concern for both the operational and long-term post-closure phases of the project:

- **Seepage of tailings porewater beneath the West embankment of the TSF to Big Onion Lake:** In the presentation to the Federal Review Panel during the public hearings and in written submissions, NRCan concluded that the likely long-term discharge of tailings porewater to Big Onion Lake would adversely impact water quality in the lake. While acknowledging the difference of opinion between NRCan and the proponent, the Panel concluded that this adverse effect could be mitigated by the installation of interception wells pumping in perpetuity if necessary. Based on the limited information provided in the current Project Description, NRCan believes that the New Prosperity Mine Development Plan does not eliminate this issue of concern.
- **Seepage of tailings porewater beneath the South embankment of the TSF to Wasp Lake and Beece Creek**: The proponent anticipates that there will be seepage of tailings porewater through the South embankment to the Beece Creek watershed (p.92) and proposes active mitigation schemes during the operational phase of the project. NRCan agrees that tailings porewater will discharge to Wasp Lake which lies at the toe of the South embankment. NRCan believes that potential adverse water quality effects and mitigation measures should be assessed for the post-closure project phase.
- **Seepage of tailings porewater beneath the Main Embankment of the TSF to Upper Fish Creek:** In the Project Description (p.25), the proponent acknowledges the possibility of tailings porewater seepage discharging in Upper Fish Creek, at the toe of the Main embankment. If this seepage does not meet water quality guidelines, the proponent proposes to capture it and pump it back to the TSF (p.25). NRCan currently lacks the information to assess if this would be a viable mitigation scheme during either the operational or post-closure phases of the project.
- **Water management of Fish Lake:** The proponent proposes various measures designed to optimize water inflows to Fish Lake to meet aquatic and fisheries objectives (p.24). These measures include capturing outflow from the lake and recycling it to supplement inflow (p.24) and capturing TSF seepage and discharging it to lake inflow (p.25). The proponent recognizes that maintaining a water balance in the lake may be a concern because its headwater catchment is largely covered by the

TSF (p.35; p.37). Based on the information provided in the Project Description, NRCan does not believe that the proponent has considered possible groundwater seepage from Fish Lake to the adjacent open pit during the operational phase of the project. This issue would exacerbate water deficit problems in Fish Lake.

- **Water management in the TSF**: The original Prosperity Project TSF featured a headwater retention pond (Prosperity Lake) designed to capture surface flows from Upper Fish Creek valley which would then drain passively to the TSF thereby maintaining a positive water balance in the facility. These features are not included in the New Prosperity TSF (Fig. 2.3, p.10; p.73). Because of the heightened embankment elevations with respect to the surrounding terrain, passive gravity drainage to the TSF from the headwaters of Upper Fish Creek is no longer possible. The New Prosperity Project Description does not address the issue of how a water cover will be maintained over PAG waste rock and tailings impounded in the TSF. NRCan views this issue as a significant concern because loss of water cover would likely promote the development of oxidizing conditions within the TSF and the generation of acidic, metal-laden seepage.

In addition, NRCan notes the concerns and uncertainties regarding seepage and seepage control measures for the project alternative, MDP Option 2, during the Prosperity Panel review that is similar to the current project proposal. The document *Supplemental Report on the Assessment of Alternatives For Tailings and Waste Rock Storage*, identifies the following issues:

- Table 11 of the Multiple Accounts Analysis, MDP Summary defines the Seepage Control for MDP 2 as Complex (i.e. leading to greater uncertainty about impacts to the environment). The proponent indicates that "embankment seepage cut-off measures (grout curtain, HDPE liner. etc..) will be required to protect Upper Fish Creek and Fish Lake ecosystem. (pg. 90)
- In the Technical Feasibility/Risks/Uncertainties rationale of Table 11 of the Multiple Accounts Analysis, MDP Summary, and the proponent defines the risk as "High" with "Moderate" uncertainties and adds that, "The seepage control measures will definitely need to be more robust to minimize water quality degradation of Upper Fish Creek and Fish Lake. (p. 91)
- In Section 5.1 (Preserving Fish Lake), the proponent explains that, "with the intent of the T2 location being to preserve Fish Lake and as much of its ecosystem as possible, significant seepage mitigation measures will be warranted. The cost of these measures, the likelihood of the need for perpetual operation of seepage mitigation measures and the additional haulage costs associated with the location make the economic risk of this option excessive. Given this, it becomes apparent that while the volume of water in Fish Lake is predicted to be maintained, over time the quality of that water will assume the characteristics of the TSF pore water quality" (p. 76).

Mine life scenarios

The original Prosperity environmental assessment was conducted with the premise of a 20-year mine life. However, during the EA process (November 1999), the proponent issued a

press release stating increased ore reserves and the likelihood of an extended (33-year) mine life. The final pit under the 33-year scenario would be 2.5 times greater in volume than the original and extend into the area occupied by Fish Lake. Also, the amount of waste rock and tailings generated would increase proportionately.

On p. 11 of the New Prosperity Project Description, the Proponent states that the mineral reserves include 7.7 million ounces of gold and 3.6 billion pounds of copper. These figures are associated with the mine development plan of a mine with 33 years of production and the larger pit. It is unclear what mineral reserves are to be exploited for a 20-year mine life (p.72), which creates some confusion over the ultimate dimensions of the pit and volume of ore to be produced.

Metal Leaching and Acid Rock Drainage

Except for the locations of the tailings storage facility (TSF), non-potentially-acid-generating (non-PAG) waste rock and ore stockpiles, the design and layout of the New Prosperity Project are essentially the same as those presented in the Environmental Impact Statement of the previous mine proposal. The current Project Description focuses on comparing the potential impacts of the new layout versus those of the previous one and outlines additional commitments to address issues raised during the panel review. As such, the new Project Description does not contain new or additional data. Acid rock drainage/metal leaching (ARD/ML) and related issues are discussed only in a relatively small section in Appendix A2 under Biotic Effects (Section A.2.2, pp.93-100).

During the panel review, in agreement with the conclusions of the provincial assessment, NRCan did not find any fatal flaws with the proponent's ARD/ML assessment and proposed mitigation measures. However, with the new mine layout, Fish Lake is directly downstream of the TSF, thus any seepage containing potentially deleterious elements will impact Fish Lake first before entering the proposed Pit Lake. The capture and treatment of this contaminated seepage would be a mitigation measure that NRCan considers as likely appropriate, but notes that this is not reflected in the Project Description. It would be expected that the proponent would incorporate such potential treatment costs in evaluating the feasibility of the proposed new project.

Conclusion

Based on the limited information provided in the New Prosperity Project Description, NRCan is unable to conclude, at this stage, as to whether or not the project is likely to result in significant adverse effects to groundwater quantity and quality taking into account mitigation measures.

In general, the proposed New Prosperity project potentially preserves Fish Lake, but raises new issues related to groundwater seepage flows and the quality of groundwater discharge to surface waters. NRCan expects that through any environmental assessment process, the proponent will conduct the kinds of detailed technical analyses (e.g., water balances for Fish Lake and the Tailings Storage Facility, 3D numeric groundwater flow models) necessary to assess potential water quantity and quality effects, and to identify mitigation measures that are feasible and appropriate.

We trust that this information is helpful for the Agency's considerations. If you have any question, please do not hesitate to contact either myself, or Rob Johnstone at (613) 992-7744.

Yours sincerely,

<original signed by>

Ginny Flood
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