

Date:	January 26, 2017
Project Title:	Treasury Metals, Goliath Gold Project
Project Number:	161-15856-00
Re:	EIS Responses, Alternatives Assessment for Tailings Impoundment Area
Document Control:	161-15856-00.01

Treasury Metals prepared an Environmental Impact Statement (EIS) for an Environmental Assessment (EA) conducted pursuant to the Canadian Environmental Assessment Act, 2012 for the Goliath Project and subject to the EIS guidelines issued on February 21, 2013. A component of the EIS guidelines was the completion of an Alternative Assessment (AA) for the Tailings Impoundment Area (TIA) using the Guidelines for the Assessment of Alternatives for Mine Waste Disposal, as administered by Environment Canada (EC).

An EIS for the Goliath Gold Project was issued to the Canadian Environmental Assessment Agency (CEAA) in April of 2015.

As part of the EA process, CEAA reviews the EIS to verify that it provides the information required by the environmental statement guidelines. CEAA has identified to Treasury Metals the areas of the EIS which require additional information prior to initiating a sufficiency review of the EIS. Several of these information requests pertained to the completed Alternatives Assessment. The purpose of this memorandum is to detail the efforts undertaken to address the areas of deficiency and to provide additional information with respect to the Alternatives Assessment for the Goliath Gold project.

Information Request 32 (IR# AA(1)-13)

This request pertains to the source of the information used in Table 4.4 of the Alternatives Assessment (AA). WSP has provided an additional column within Table 4.4, detailing the source of the information used to evaluate the alternatives for the TIA. Updated tables for the AA are provided with this memo.

Information Request 33 (IR#AA(1)-14)

A more detailed description of indicator parameters for each qualitative sub account was requested for Table 4.3. This information has been provided such that is should be clear to an independent reviewer what the basis is for the characterization criteria stipulated for any alternative. Please refer to the updated and more detailed Table 4.3 attached that clarifies indicator parameters between alternatives for qualitative factors.

Information Request 34 (IR#AA(1)-15)

Additional detail was requested to be provided for the scoring scale for qualitative indicators. Accordingly, Table 4.5 (attached) has been updated to provide further definition on the range of sensitivities used to score all qualitative indicators.

Information Request 35 (IR#AA(1)-16)

It was noted in the review, that the value scales for some quantitative indicators did not sufficiently differentiate each alternative in accordance with the guidelines. The “worst” and the “best” values have

been assigned to the end values of the scoring ranges for all quantitative indicators. Please refer to the attached Table 4.5 which sets out the updated scoring for quantitative indicators.

Information Request 36 (IR#AA(1)-17)

To differentiate between all alternatives considered in this assessment, the value scale ranges used to score all quantitative indicators in Table 4.5 have been adjusted so that they are consistent to ensure that scoring is proportional for each value in the scale. Table 4.5 is attached for reference.

Information Request 37 (IR#AA(1)-18)

It was noted during the review process, that several indicators have metrics which are measured identically in the Alternatives Assessment. A review of indicators and accounts was completed to ensure that metrics for the indicators are unique, so as to remove the possibility of double counting.

For subaccounts "Potential for Greenhouse Gas Emission" and "Noise":

These two have been combined into "Potential for Greenhouse Gas and Noise Emissions", as the increased amount of truck traffic would increase the potential for both gas and noise emissions.

For subaccounts "Number of Main Watersheds Affected" and "Number of Watershed":

The "Number of Streams Directly Impacted" and "Number of Water Bodies Directly Impacted" have been combined into a single subaccount titled "Permanent Streams Impacted". The Category "Indirect Impacts (Downstream flow Reductions)" remains as a separate account.

For subaccounts "Distance from Plant Site" and "Operation Distance":

It is recommended that these two subaccounts remain separate as the quantitative indicator values are different for each of the categories. Distance from the Plant Site (Environmental Category) refers to the road haul distance from the plant site to structure. An increase in distance results in more construction, higher consumables and increased emissions. Operation Distance refers to the distance of the pipeline or access roads required for placement of fill. It takes into account preliminary pipeline or haul road alignments, and perimeter distance of the facility for piping or placement of tailings.

For subaccounts "Storage Facility and Associated Infrastructure Footprint" and "Existing Vegetation":

It is recommended that these two subaccounts remain. However, "Existing Vegetation" indicator parameters has been changed from the hectares affected to the number of ecosites affected.

For subaccounts "Slope Stability" and "Visual Impact":

These two subaccounts have been combined into the "Slope Stability" account.

For subaccounts "Risk to Human Health" and "Risk to Worker Safety":

These two subaccounts have been combined into a single category titled "Risk to Worker Health and Safety"

For subaccounts "Economic Benefits to Regional Communities" and "Regional Job Creation and Diversity":

These two subaccounts have been combined into a single category titled "Economic Benefits to Regional Communities"

For subaccounts "Aboriginal Rights" and "Extent of Traditional Land Use":

These two subaccounts have been combined under Traditional Land Use.

The Alternatives Assessment Tables have been updated to reflect these changes.

Information Request 38 (IR#AA(1)-19)

During the review process, it was noted that for some specific indicators were assigned qualitative indicators where it was thought that these indicators could have been assigned quantitative metrics. Further assessment was requested to define indicators in parametric terms or provide justification as to why these indicators were defined qualitatively. The following indicators were reviewed, and our response is discussed in detail as follows:

Potential Impacts to Water Quality:

At the time of completion of the Alternatives Assessment, the potential impacts to water quality due to the presence of a TIA was completed in qualitative terms. The design of the TIA had not yet been advanced to a level whereby the selection of the construction materials had been completed in order to complete the TIA design. A design of the TIA with details on foundation materials, construction specifications and material specifications would be required to complete studies to determine the pH or metal leaching concentrations. A site investigation is currently in progress to determine types of materials available on site for the construction of the dam (borrow sources), foundation materials and parameters that will assist with the design of the TIA. As a result, qualitative parameters were selected in order to rank each of the alternatives.

Construction Material Availability:

This account had been defined in terms of a qualitative indicator for the following reasons. The design of the TIA had not been advanced to a level sufficient to predict the volume and parameters of materials required for construction in terms of quantity, or quality. In addition, borrow source studies and investigations have not been completed to a sufficient level of detail to accurately predict the amount of material available on or off site. Site investigation programs and testing are currently being completed or planned on site to determine the amount and parameters that may be available on site. The TIA design will be advanced based on the availability of material and the associated material parameters.

Tailings Storage Expansion Capacity:

The design goal for the TIA is that it satisfy the requirement to hold the currently estimated volume of tailings produced by mine from the proposed underground and open pit mine plan (minus any tailings that are planned to be stored elsewhere such as underground as fill). Should additional reserves be proven, further studies and design work would be required to plan for the storage of these materials and all applicable codes, guidelines and permit requirements would be followed. It is unknown at this time if additional capacity may be required. This indicator was selected to measure the possibility to expand the TIA if required from a ranking perspective as some of the geographical locations have little opportunity for expansion, and some in situ parameters such as foundation materials may limit the ability to store additional capacity. Insufficient data is available at this time to use parametric parameters for this account.

Summary

As a result of the preparation of the updates, all of the updated tables for the Alternatives Assessment have been included with this memo.

The following summary conclusions are provided:

- An Alternatives Assessment was completed to enable the selection of the Tailings Impoundment Area location and deposition technology. Seven (7) locations and four (4) deposition technologies were assessed with a total of 22 potential alternatives. The assessment followed Environment Canada's Guidelines for the Assessment of Alternatives for Mine Waste Disposal (Environment and Climate Change Canada, 2013). Several input indicators were assessed for the Environmental, Technical, Economic and Socio-Economic indicators;

- A pre-screening assessment was used in accordance with the guidelines to identify options that were advanced through the Alternatives Assessment process;
- The results of the Alternatives Assessment showed that Location 1 with conventional tailings deposition and future co-disposal of tailings into the underground mine workings (Option 1D) had the highest alternative merit score;
- The results of the sensitivity analysis were consistent with the Alternatives Assessment with Option 1D returning the highest alternative merit score;
- Option 1D is recommended as the preferred alternative for tailings management at the Goliath Project Site;
- Design parameters and assumptions developed to complete the Alternative Assessment and augmented for the geotechnical field program that is presently underway, will form the basis for the design of the tailings Storage Facility as the project is advanced to subsequent levels of design. Parameters and assumptions will be confirmed/refined/optimized during the subsequent levels of design as site specific information is obtained and design of other project component (open pit, underground, waste rock stockpiles, site runoff and collection systems, etc.) are completed.

The required edits to the Alternative Assessment tables did not change substantially from the results of the Alternatives Assessment dated July 21, 2014 completed by WSP.

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