



Impact Assessment Agency of Canada



ANALYSIS OF BW GOLD LTD.'S PROPOSED CHANGES TO THE BLACKWATER
GOLD PROJECT

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Introduction

The Blackwater Gold Project (the Project), as proposed by BW Gold Ltd. (the Proponent), includes the construction, operation, and closure of an open-pit gold and silver mine located approximately 110 kilometres southwest of Vanderhoof, British Columbia. The Project will produce 60,000 tonnes per day of gold and silver ore, originally over a mine life of 17 years.

The Project was subject to an environmental assessment under the Canadian Environmental Assessment Act, 2012 (CEAA 2012). The environmental assessment was conducted by the Canadian Environmental Assessment Agency. The former Minister of Environment and Climate Change issued a Decision Statement under CEAA 2012 for the Project on April 15, 2019. The Decision Statement contains 172 legally binding conditions, which include mitigation measures and follow-up requirements that the proponent must comply with throughout the life of the Project.

On August 28, 2019, the Impact Assessment Act (IAA) came into force, repealing the Canadian Environmental Assessment Act, 2012 (CEAA 2012). Section 184 of the IAA provides that Decision Statements issued under CEAA 2012 are deemed to be Decision Statements under the IAA and therefore subject to the provisions of the IAA. In addition, the Canadian Environmental Assessment Agency is now the Impact Assessment Agency of Canada (the Agency). In this report, the term “Agency” refers to either the former Canadian Environmental Assessment Agency or the current Impact Assessment Agency of Canada.

Since the issuance of the Decision Statement, the Proponent has informed the Agency of proposed changes to the Project. The Agency conducted an analysis of the proposed Project changes and the potential adverse environmental effects of those changes, including additional impacts on the exercise of rights of Indigenous groups, to assess:

- whether the changes constitute a new or different designated project that may require a new impact assessment; and
- whether any changes (including addition or removal) may be required to the mitigation measures and follow-up requirements included as conditions in the Decision Statement to address the proposed Project changes.

The Agency's analysis is summarized in this report.

1. Proposed Project Changes

The Proponent is proposing the following changes to the Project:

- Extend duration of the Operation phase from 17 years to 23 years;
- Reduce duration of the Closure phase from 24 to 14 years;
- Updates to the design of the tailings storage facility (TSF), including an increase in TSF volume, decrease in TSF footprint, and moving the Site C dam downstream;
- Addition of a water management pond to manage water released from the water treatment plants and non-contact surface runoff, providing water for ore processing;
- Updates to the design of the process plant, including a decrease in footprint and earlier construction of the water treatment plant;
- Updates to the design of the waste rock dump and low grade ore stockpile, including a decrease in the upper and lower waste rock storage facilities footprint and an increase in the low grade ore footprint;
- Increase in number of topsoil stockpiles;
- Decrease in the footprint of the construction laydown and truck shop;
- Change in capacity for the construction camp to accommodate up to 516 people (initially proposed to accommodate 1000 to 1500 people) and the operations camp to accommodate up to 532 people (initially proposed to accommodate 500 people); and
- Addition of a domestic wastewater treatment system for the operations camp.

1.1 Agency's Analysis of Changes

The *Physical Activities Regulations* under the IAA identify the physical activities that constitute designated projects that may require an impact assessment. The Agency is of the view that the proposed changes do not constitute a new or different designated project that may require a new impact assessment.

The Agency analyzed the potential adverse environmental effects of the proposed changes to determine whether the mitigation measures and follow-up requirements included as conditions in the Decision Statement may require additions or alterations to account for the revised approach, and whether any additional impacts on the exercise of rights may occur on the Indigenous groups identified in the Decision Statement, or on any other Indigenous groups. The Agency is of the view that no modifications to the mitigation measures and follow-up requirements included as conditions in the Decision Statement are necessary.

2. Potential Adverse Environmental Effects from Proposed Project Changes

The following is an analysis of whether any of the changes to the Project would require modifications, including addition or removal, to the mitigation measures and follow-up requirements included as conditions in the Decision Statement.

In July 2022, the Proponent submitted information to the Agency describing the proposed changes to the Project. The Proponent conducted a screening of potential interactions between valued components of the environment assessed during the initial environmental assessment and the optimized Project when taking into account the proposed changes. This indicated potential interactions between the optimized Project and the following valued components:

- Aquatic Environment:
 - Surface Water Flow;
 - Surface Water Quality;
 - Groundwater Quantity;
 - Groundwater Quality;
- Fish and Fish Habitat; and
- Health Conditions of Indigenous Peoples.

After characterizing the residual effects for each of these valued components in the context of the optimized Project and comparing them with the characterization completed in the initial environmental assessment, the Proponent determined that there is no change to the significance of residual effects on these valued components. The Proponent stated that no significant adverse environmental effects are anticipated and the conclusions of the initial environmental assessment are unchanged when taking into consideration the project changes, and no amendment to the conditions in the Decision Statement is required.

2.1 Aquatic Environment – Surface Water Flow

The initial environmental assessment determined that the Project is likely to result in changes to surface water flows compared to baseline conditions, including decreases and increases in stream flow for different watersheds due to the development of infrastructure and diversion of flow.

2.1.1 Proponent’s Assessment

The Proponent updated baseline watershed modelling and site-wide water balance modelling to reflect the optimized project. Table 1 summarizes the Proponent’s assessment of potential changes to residual effects characterization for surface water flow in the context of the optimized Project.

Waterbody	Potential changes to residual effects characterization
Davidson Creek	Changes in surface water quantity downstream of the Project will be moderate to high in magnitude from Construction through Closure, local in extent, and reversible.
Creek 661	Changes in surface water quantity will be negligible to high in magnitude from Construction through Closure, local in extent, and irreversible.
Chedakuz Creek	Changes in surface water quantity will be negligible to moderate in magnitude from Construction through Closure, local in extent, and reversible.

TABLE 1 Summary of the potential changes to residual effects characterizations for surface water flow for the optimized Project compared to the initial environmental assessment.

The Proponent stated that the project changes do not change the significance characterization of the Project’s residual effects on surface water flow. The Proponent concludes that stream flows in Davidson Creek will be mitigated with the fresh water supply system to maintain instream flow needs for fish, and therefore stream flows will meet the minimum instream flow needs criteria. Additional mitigation measures are not proposed and changes to current mitigation measures and mine site water monitoring/management plans are not required.

2.1.2 Agency’s Analysis and Conclusions

The Agency is of the view that the proposed changes to the Project would not result in adverse effects to surface water flow beyond those that were identified in the Environmental Assessment Report because existing mitigation measures will be sufficient to capture any variations in surface water flow from the optimized Project. The Decision Statement outlines the requirement for the Proponent to maintain instream flow needs in Davidson Creek within rates identified in the Proponent’s Environmental Impact Statement (condition 3.8). The Proponent will also need to monitor surface water flow as part of follow-up programs involving Davidson Creek, Creek 661, and Chedakuz Creek (conditions 3.15 and 3.16). The Agency is therefore of the view that no changes are required to the key mitigation measures and follow-up requirements identified in the initial environmental assessment and set out as conditions in the Decision Statement.

2.2 Aquatic Environment – Surface Water Quality

The environmental assessment determined that the Project was likely to result in changes to surface water quality caused by surface water discharges to the receiving environment, groundwater seepage from Project components, erosion and sedimentation, and atmospheric dust deposition.

2.2.1 Proponent's Assessment

The Proponent reproduced the modelling and methods from the environmental assessment to analyze the effects of the optimized Project on surface water quality. The Proponent determined that the effects of the optimized Project on this valued component were to be the same as those identified during the environmental assessment, and no additional pathways of effects to surface water quality were identified.

The optimized Project is expected to change the magnitude rating of residual effects from moderate to high and change the duration of effect from far-future to long-term, driven by predicted concentrations in total antimony. The Proponent states that the residual effects for the optimized Project stem from a predicted increase in concentrations of total manganese, total antimony, dissolved aluminum, and dissolved cadmium. The optimized Project is not anticipated to change the significance of the Project's residual effects on surface water and the characterization of the remaining residual effects criteria for surface discharge and groundwater seepage remains the same as in the environmental assessment, as they remain in the range of natural variation. As such, the Proponent concluded that changes to current mitigation measures, management plans, and Decision Statement conditions are not recommended.

The Proponent characterizes the significance of residual effects to surface water quality the same as in the environmental assessment ("not significant"). However, the magnitude of residual effects for the optimized Project is now characterized as being high, compared to being medium for the original Project. The Proponent also notes that the overall residual effects characterization for surface water quality is based on total antimony, which reflects the contaminant of potential concern with the highest magnitude rating that is predicted to occur for the longest period of time and the highest number of water balance/quality model nodes in Davidson Creek.

2.2.2 Agency's Analysis and Conclusions

The Agency is of the view that the proposed changes to the Project would not result in adverse effects to surface water quality beyond those that were identified in the Environmental Assessment Report because existing mitigation measures will be sufficient to capture any variations in surface water quality for the optimized Project. With regards to the predicted increase in concentrations of total manganese, total antimony, dissolved aluminum, and dissolved cadmium, the Decision Statement includes requirements for the Proponent to monitor water quality for contaminants of potential concern (condition 3.15), including those identified in Table 5 of the Environmental Assessment Report. The variations between the Project as assessed in the environmental assessment and the optimized Project would be captured by this requirement. The Agency is therefore of the view that no changes are required to the key mitigation measures and follow-up requirements identified in the initial environmental assessment and set out as conditions in the Decision Statement.

2.3 Aquatic Environment – Groundwater Quantity

The environmental assessment determined that the Project may result in effects on groundwater quantity caused by a decrease in groundwater discharge and a decrease in the groundwater table at different phases of the Project.

2.3.1 Proponent's Assessment

The Proponent conducted numerical groundwater modelling in order to assess the potential effects of the optimized Project. This modelling indicated that the optimized Project is expected to result in residual effects to groundwater quantity. Overall, the optimized Project will result in low to high magnitude changes in baseflow contributions for Davidson Creek in the sub-catchment immediately downstream of optimized Project components, and no changes from baseline contributions in any phase of the sub-catchments further downstream. The significance of the residual effects have increased from “not significant (negligible)” to “not significant (minor)”, however the Proponent notes that despite the increase in the Project's residual effects to groundwater quantity, those effects remain “not significant”. As such, the Proponent is of the view that changes to existing conditions in the Decision Statement would not be warranted.

2.3.2 Agency's Analysis and Conclusions

The Agency is of the view that the proposed changes to the Project would not result in adverse effects to groundwater quantity beyond those that were identified in the Environmental Assessment Report because existing mitigation measures will be sufficient to capture any variations in groundwater quantity for the optimized Project. The Agency notes that conditions in the Decision Statement require the Proponent to monitor groundwater quantity and confirm whether the parameters are at or below established modelled predictions. The Agency is satisfied with the Proponent's conclusions that the potential increase in magnitude of changes in baseflow contributions for Davidson Creek will still remain below the threshold of significance with the application of the aforementioned monitoring measures. The Agency is therefore of the view that no changes are required to the key mitigation measures and follow-up requirements identified in the initial environmental assessment and set out as conditions in the Decision Statement.

2.4 Aquatic Environment – Groundwater Quality

The environmental assessment determined that no residual effects were expected to groundwater quality during the construction phase of the Project, predominantly localized residual effects were expected during the operations and closure phases, and seepage traveling along deeper groundwater flow paths were expected to enter Davidson Creek and Creek 661 during the post-closure phase.

2.4.1 Proponent's Assessment

The Proponent conducted numerical groundwater modelling in order to assess the potential effects of the optimized Project. According to this modelling, the optimized Project is not anticipated to change the significance of the Project's residual effects on groundwater quality, therefore changes to conditions included in the Decision Statement are not required. Nevertheless, the Proponent has proposed additional mitigation measures for water management which include capturing seepage from the toe of the Upper Waste Stockpile for treatment during the Operations and Post-Closure phases and preventing pit lake seepage to the downstream receiving environment in the Post-Closure phase by operating the pit lake as a groundwater sink.

2.4.2 Agency's Analysis and Conclusions

The Agency is of the view that the proposed changes to the Project would not result in adverse effects to groundwater quality beyond those that were identified in the Environmental Assessment Report because existing mitigation measures will be sufficient to capture any variations in groundwater quality for the optimized Project. The Agency notes that the same conditions in the Decision Statement that require the Proponent to monitor groundwater quantity apply for groundwater quality. Therefore, the Proponent is required to confirm whether the parameters for groundwater quality are at or below established modelled predictions. The Agency is satisfied with the Proponent's conclusions that any change in residual effects to groundwater quality from the operations, closure or post-containment phases will remain below the relevant thresholds of significance with the application of the aforementioned monitoring measures. The Agency is therefore of the view that no changes are required to the key mitigation measures and follow-up requirements identified in the initial environmental assessment and set out as conditions in the Decision Statement.

2.5 Fish and Fish Habitat

The environmental assessment determined that the Project could result in the unavoidable direct mortality of fish in Davidson Creek and Creek 661, changes in fish health localized to Davidson Creek as a result of changes in water quality, loss and isolation of fish and fish habitat during construction, and permanent loss of fish habitat due to changes in stream flow. The Agency determined that, with the implementation of mitigation measures, the Project was not likely to cause significant adverse environmental effects to fish and fish habitat.

2.5.1 Proponent's Assessment

The Proponent assessed the effects of the optimized Project on fish and fish habitat through updated and refined planning, modelling, and monitoring, including refinement of the Project's mine plan, collection of additional baseline monitoring data for surface water, updates to the baseline watershed model, updates to the site-wide water balance model, and updates to the water quality modelling for the Project. The Proponent determined that the optimized Project could potentially result in a reduction of available suitable habitat for Rainbow Trout and Kokanee, the potential to affect fish life history requirements, and potential changes to aquatic health due to changes in water chemistry.

Overall, the residual effects for the optimized Project are similar to those identified in the original impact assessment, with the exception of changes in fish health due to changes in surface water quality; no

additional pathways of effects to fish and fish habitat are identified. The main difference between the project as assessed and the optimized Project are that effects on fish health due to changes in surface water quality in Davidson Creek are considered reversible when considering Project changes, as opposed to initially being irreversible.

The Proponent concludes that Project changes are not anticipated to change the significance of the Project's residual effects on fish and fish habitat, and in fact, some improvements to water quality can be expected. Additional mitigation measures are not proposed and changes to current mitigation measures, management plans or Decision Statement conditions are not required.

2.5.2 Agency's Analysis and Conclusions

The Agency is of the view that the proposed changes to the Project would not result in adverse effects to fish and fish habitat beyond those that were identified in the Environmental Assessment Report because existing mitigation measures are sufficient. The Agency is in agreement with the Proponent that no new pathways of effects have been identified, and that due to the reduction in severity of potential effects to Davidson Creek, the overall effects to fish and fish habitat from the optimized Project are reduced. The Agency is therefore of the view that no changes are required to the key mitigation measures and follow-up requirements identified in the initial environmental assessment and set out as conditions in the Decision Statement.

2.6 Health Conditions of Indigenous Peoples

The environmental assessment determined that the Project could result in health effects for Indigenous and non-Indigenous peoples from environmental exposure to noise and contaminants (both rated as not significant). No cumulative effects assessment was conducted because the magnitude of predicted adverse effects to human health was negligible.

2.6.1 Proponent's Assessment

The Proponent assessed the effects of the optimized Project on human health through updated and refined planning, modelling, and monitoring, including refinement of the Project's mine plan, extensive changes to the guidance for conducting prospective human health risk assessments (HHRAs) in the context of environmental assessment from provincial and federal authorities, collection of additional baseline monitoring data for surface water, updates to water quality modelling, and updates to human health-specific environmental media guidelines, BC Ambient Air Quality Objectives (BC ENV 2020), Canadian Ambient Air Quality Standards (CCME 2021), and toxicity reference values (Health Canada 2021b).

According to the Proponent, no changes to potential effects on human health due to noise are expected from the optimized Project compared to the original impact assessment. Although the optimized Project will have an operations phase that runs 6 years longer, the open-pit mining (and associated blasting) which generates most of the noise at the mine site will still end in Year 17. Some noise associated with machinery and the process plant will still occur, though this will be limited to within the mine site.

Although there appears to be an increase in some contaminants following the updated analysis, the Proponent indicates that effects to human health from the optimized Project are still below threshold

standards and the risk to human health remains negligible. In the Proponent's view, exposure to contaminants is negligible compared to similar exposures from country foods and market foods, which are a source of heavy metals and other contaminants.

The magnitude of residual effects is rated as negligible (effects may be indistinguishable in the population), as the incremental changes in hazard quotients and incremental life cancer risks were not significant or below acceptable thresholds, and changes in human health were not predicted. The geographic extent of the effects are local (within the local study area), the duration of residual effects is long term (from 17 to less than 35 years), the effects are rated as reversible, the likelihood for effects to human health is rated as low, and the significance of residual effects is rated as not significant – negligible. The updated residual effects characterization for the optimized Project is the same as the one provided previously in the environmental assessment.

The Proponent concludes that the changes in environmental media quality (soil, water, air country foods) associated with the optimized Project is not anticipated to change the significance of the Project's residual effects on human health, and additional mitigation measures are not proposed. Likewise, changes to current mitigation measures, monitoring plans or Decision Statement conditions are not required.

2.6.2 Agency's Analysis and Conclusions

The Agency is of the view that the proposed changes to the Project would not result in adverse effects to the health conditions of Indigenous Peoples beyond those that were identified in the Environmental Assessment Report because existing mitigation measures are sufficient. With regards to effects from noise, the Agency is in agreement with the Proponent that although the operations phase of the optimized Project will extend for another 6 years, the length of the noise-intensive open-pit mining will not increase. In addition, the Agency is in agreement with the Proponent that the minor increase in contaminants for the optimized Project is still below threshold standards for human health. The thresholds contained within the conditions in the Decision Statement remain sufficient to mitigate potential adverse effects to human health. The Agency is therefore of the view that no changes are required to the key mitigation measures and follow-up requirements identified in the initial environmental assessment and set out as conditions in the Decision Statement.

2.7 Rights of Indigenous Peoples

The environmental assessment assessed impacts to Indigenous rights. The Agency considered the concerns and input from Nazko First Nation, Skin Tyee Nation, Tsilhqot'in Nation, Métis Nation British Columbia, and Nee-Tahi-Buhn Band regarding the impacts of the Project on Aboriginal rights or title, including on the proponent's proposed mitigation and accommodation measures, and comments provided by Indigenous groups during the environmental assessment. Concerns were expressed by Indigenous groups about the impact of the Project's transmission line, the size of the mine site footprint, and effects to the water quality of Tatelkuz Lake. In the Environmental Assessment Report, the Agency concluded that with the mitigation measures identified by the Proponent, the impact of the Project on the Aboriginal rights and title of Nazko First Nation, Skin Tyee Nation, Tsilhqot'in Nation, Métis Nation British Columbia, and Nee-Tahi-Buhn Band would be negligible to low.

The predicted changes to effects resulting from the optimized Project do not intersect with the concerns identified by Indigenous groups during the initial environmental assessment. In addition, through the analysis described in this report, the Agency is of the view that the changes from the optimized Project do not change the significance of effects identified in the Environmental Assessment Report. This includes potential effects on the rights of Indigenous Peoples. For these reasons, the Agency is of the opinion that the changes proposed by the Proponent for the optimized Project will not result in additional impacts to the rights of Indigenous Peoples.

3. Conclusion

Based on the information provided by the Proponent, the Agency does not consider the proposed changes to the Project to increase the extent to which the effects of the Project, as assessed during the initial environmental assessment, are adverse.

The Agency considers existing conditions in the Decision Statement (including monitoring and follow-up conditions) sufficient to address the potential interactions between the optimized Project and the valued components identified by the Proponent (the aquatic environment, fish and fish habitat, and the health conditions of Indigenous peoples). The Agency is of view that after characterizing the residual effects for each of these valued components in the context of the optimized Project and comparing them with the characterization completed in the initial environmental assessment, there is no change to the significance of residual effects on these valued components.

The Agency is therefore of the view that the changes to the Project as proposed by the Proponent would not increase the extent to which the effects of the Project, as assessed during the environmental assessment, are adverse. The Agency is also of the view that the rights of Indigenous peoples would not be additionally impacted due to the changes to the Project.