
Grassy Mountain Coal Project Joint Review Panel

May 22, 2020

By email only

Mr. Martin Ignasiak
Partner, Osler, Hoskin & Harcourt LLP
450 – 1st Street S.W.
Calgary AB T2P 5H1

Subject: Outcome of review of additional information submitted by Benga Mining Ltd. for the Grassy Mountain Coal Project and requests for additional information concerning minor information deficiencies

Dear Mr. Ignasiak:

As required by its Terms of Reference (CIAR #80), the Joint Review Panel (the Panel) appointed to carry out an assessment of the environmental effects of the Grassy Mountain Coal Project (the Project) must determine whether the information on the public registry is sufficient to proceed to the public hearing stage of the process. The Panel must also determine whether the information provided by Benga Mining Limited (Benga) is complete for the purposes of the provincial Environmental Impact Assessment (EIA). The Panel has completed its review of the additional information submitted by Benga for the Project, including Addendum 11, and has considered all comments received in response to the public comment period which ended on May 4, 2020. The Panel has also considered Benga's response to the public comments received on May 13, 2020 (CIAR #350).

The question of whether the information provided complies with the Panel's Terms of Reference and is sufficient to proceed to hearing is not based on whether there is agreement with Benga's information, analysis, or conclusions. In the next stage of the review process, individuals or groups that are granted participation in the hearing will have the opportunity to submit evidence to the Panel, and to test Benga's evidence. The Panel has determined that the concerns raised in the public comments can be addressed effectively through the hearing process.

The Panel has determined that it requires additional information related to hydrology, human and wildlife health and climate change effects. Considering the whole of the information provided to date, the Panel considers the information deficiencies in these areas to be minor in nature. Following the timely receipt of complete and sufficient responses from Benga to the Panel's requests for additional information, the Panel is prepared to move to the next stage of the environmental assessment process, which would include: deeming the EIA complete, confirming

the sufficiency of the additional information provided by Benga, and issuing the notice of hearing.

Given the minor nature of the additional information requested, when considered in relation to the whole of the information already provided, the Panel requests a commitment from Benga to provide the information in a timely manner in accordance with section 15 of its Terms of Reference. A public comment period will not be held prior to the issuance of the notice of hearing. Participants in the hearing process will have an opportunity to review the responses, along with all other material on the public registry, and provide written submissions and/or oral presentations to the Panel.

Benga should also provide the reference list and updated compilation of mitigation measures and commitments as requested by the Panel in its letter to Benga dated April 8, 2020 (CIAR #330) at the same time as it provides responses to the attached requests.

The additional information provided by Benga will be posted to the Canadian Impact Assessment Registry for the Project (reference number 80101).

The Panel requests that Benga provide an estimated timeline for submission of this information by May 29, 2020.

If you have any questions regarding this letter, you are encouraged to contact Samantha Sabo, Acting Panel Manager at IAAC.GrassyMountain.AEIC@canada.ca.

Yours truly,

<Original signed by>

Alex Bolton
Chair, Joint Review Panel

cc: Mike Bartlett, Senior Project Manager, Millennium EMS Solutions Ltd.

Attachment: Requests for additional information concerning minor information deficiencies. May 22, 2020

Attachment: Requests for additional information concerning minor information deficiencies

May 22, 2020

Human and Wildlife Health

Request 7.1

References:

Eleventh Addendum to the Environmental Impact Assessment. Response to Information Request 6.25, 6.27 and 6.28. Appendix 6.25-1, Appendix 6.27-1 and Appendix 6.28-1, Figures 6.25-7 and 6.25-7. (CIAR #313).

Rationale:

In response to Information Request (IR) 6.27 (CIAR#313), Benga provided an update to the Human Health Risk Assessment (HHRA) to include water-based exposure pathways in the Local Study Area (LSA), Regional Study Area (RSA), the Oldman Reservoir and the end pit lake in the post-closure landscape (Addendum 11, Appendix 6.27-1).

Benga's response to IR 6.27, which includes Appendix 6.27-1 of Addendum 11, lacked details regarding how water-based exposure pathways were incorporated into the HHRA. For example, Benga did not provide a table containing the concentrations of contaminants of potential concern (COPCs) that were used for each water source (i.e. the sedimentation ponds, end pit lake, Blairmore Creek, Gold Creek, and the Oldman Reservoir) in its modelling for evaluating the risks to human health. Benga also did not provide a description of the methods used to estimate concentrations of COPCs in the end pit lake or the Oldman Reservoir (except for selenium). Finally, Benga did not describe how atmospheric deposition to water was combined with the modelling of mean monthly COPC concentrations in Blairmore Creek and Gold Creek (Appendix 6.25-1 of Addendum 11). In the absence of this information, the Panel is unable to evaluate the level of conservatism used by Benga to incorporate water-based pathways into the HHRA. Although Benga provided the assumptions used to determine the duration and frequency of exposure to water-based pathways, the response does not clearly explain how assumed concentrations of COPCs were derived from the water quality modelling results presented in Appendix 6.25-1 of Addendum 11. Therefore, the Panel cannot assess the significance of the revised hazard quotients.

In response to IR 6.28 (CIAR#313), Benga provided a table containing the concentrations of COPCs that were used for each water source in the modelling for evaluating the risks to wildlife health. However, in the updated Wildlife Health Risk Assessment (WHRA) (Appendix 6.28-1 of Addendum 11), Benga did not explain how the COPC concentrations were derived and did not provide a rationale to demonstrate

their suitability and level of conservatism. Furthermore, it is unknown whether the concentrations used for the WHRA are the same as those used in the HHRA.

Therefore, the Panel requires more information to understand and evaluate the assessment conducted by Benga, and have confidence in its conclusions. Information is required regarding the details of how concentrations of COPCs were derived and the level of conservatism represented by the derived concentrations.

Request for additional information:

- a) Provide a table, similar to that provided for the WHRA in Addendum 11, Appendix A of Appendix 6.28-1, that presents the concentrations of COPCs that were used for each water source considered in the revised HHRA (i.e. the sedimentation ponds, end pit lake, Blairmore Creek, Gold Creek, and the Oldman Reservoir);
- b) Discuss how the COPC water concentrations used for the sedimentation ponds, end pit lake, Blairmore Creek, Gold Creek, and the Oldman Reservoir for both the HHRA and WHRA were derived, and explain the level of conservatism represented by the derived concentrations. Include the following details to support this discussion:
 - i. Identify the statistic selected from the range of monthly predicted concentrations produced by the modelling of water quality in Blairmore Creek and Gold Creek (as per the mean monthly modelling results presented in Appendix 6.25-1) (e.g. annual mean, annual median, or maximum), and present the rationale for the level of conservatism represented by that statistic. For the end pit lake, identify the statistic selected based on data from other end pit lakes used as a surrogate by Benga; and
 - ii. Consider the sensitivity analysis modelling runs presented in Figures 6.25-6 and 6.25-7 for Blairmore Creek and Gold Creek, which assumed that the saturated backfill zone would result in 90% and 95% removal of selenium rather than 99% removal, and comment on the relative effect on the risk characterization when alternative selenium removal assumptions are used.
- c) Provide detailed examples of how Benga calculated hazard quotients for the multimedia assessment of risk to human health (Tables 7-1 to 7-4 of Appendix 6.27-1) and the exposure ratios for the multimedia assessment of risk to wildlife health (Tables D-1 to D-6 of Appendix D of Appendix 6.28-1) to demonstrate how Benga has integrated both the air and water exposure pathways for the HHRA and WHRA. Worked examples for risk to human health should include calculation of hazard quotients and incremental lifetime cancer risk for fluoranthene, cadmium and arsenic in the end pit lake, Blairmore Creek, Gold Creek and the Oldman Reservoir. Worked examples for risk to wildlife health should include calculations of exposure ratios for Northern River Otter, American Dipper and Mallard Duck calculated for selenium and zinc in the sedimentation ponds, end pit lake, Blairmore Creek, Gold Creek and the Oldman Reservoir.

Climate Change

Request 7.2

References:

Eleventh Addendum to the Environmental Impact Assessment. Response to Information Request 6.25. Figure 6.25-1, Figure 6.25-2. (CIAR #313).

Rationale:

In response to IR 6.25 (CIAR #313), Benga stated that Figures 6.25-1 and 6.25-2 portray updated flows for Gold Creek and Blairmore Creek on a mean monthly basis with climate change modelling incorporated in the updated hydrological inputs. In its response, Benga provided a series of figures demonstrating the variability in mean monthly concentrations of contaminants of potential concern (COPCs). As Benga did not provide an accompanying description of how climate change was integrated, it remains unclear how climate change modelling was incorporated into the updated hydrology figures.

Request for additional information:

Describe how climate change was incorporated into the updated hydrological model, including:

- a) The climate change scenario used, and the main results extracted from this scenario which informed Benga's updated hydrology assessment;
- b) How the selected scenario compares with other generally accepted scenarios in terms of mean annual precipitation and mean annual temperature; and
- c) How the updated hydrological model was used to generate the monthly flows shown in Figures 6.25-1 and 6.25-2 of Addendum 11.

Hydrology

Request 7.3

References:

Tenth Addendum to the Environmental Impact Assessment. Response to Information Request 5.3. (CIAR #251).

Eleventh Addendum to the Environmental Impact Assessment. Response to Information Request 6.13. (CIAR #313).

Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada. Fisheries and Oceans Canada. (2013).

A Desk-top Method for Establishing Environmental Flows in Alberta Rivers and Streams. Government of Alberta. (2011).

Guide to Compelling Reasons to not take the 10% Holdback for Water Transfers within the South Saskatchewan River Basin. Government of Alberta. (2015).

Rationale:

Water Conservation Objective Conditions in the New Licence

Benga has applied for a new licence for 185,022 m³ of surface runoff in the Gold Creek and Blairmore Creek watersheds from the Crown Reservation under the Oldman Water Allocation Order. The South Saskatchewan River Basin (SSRB) Plan requires that any licences issued for applications received after May 1, 2005 be subject to the appropriate Water Conservation Objective (WCO). The Oldman River WCO for Oldman River headwaters will likely apply to the new (Crown reservation) licence, if approved.

Minimum Release Criteria for the Aquatic Environment

Benga is proposing to transfer two licences to the Gold Creek and Blairmore Creek watersheds: one from Crowsnest River and one from York Creek. The SSRB Plan's Matters and Factors state that transfers should have no significant adverse effect on other users and the aquatic environment.

Although the Crowsnest River has an established WCO, neither Gold Creek nor Blairmore Creek have an established instream objective (IO). In order to ensure no significant adverse effect on Gold Creek and Blairmore Creek, as required by the SSRB Plan, specific minimum release criteria for Gold Creek and Blairmore Creek will likely be required as conditions to the licences, if approved. The minimum release criteria will likely be based on either the Fisheries and Oceans Canada (DFO) framework¹ or the Alberta Desktop Method².

10% Holdback for Water Transfers

Alberta Environment and Parks' (AEP) *Guide to Compelling Reasons to not take the 10% Holdback for Water Transfers within the SSRB*³ documents past decisions where minimum flow conditions were added to transferred licences instead of withholding the 10% WCO holdback. The guide indicated that successful implementation of minimum release criteria may provide a greater benefit to streams than withholding 10% of the transferred water. In Benga's case, minimum flow conditions will

¹ Available Online: Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada (2013). <https://www.conservationgateway.org/ConservationPractices/Freshwater/EnvironmentalFlows/MethodsandTools/ELO/HA/Documents/Fisheries-and-Oceans-Canada-SAR-2013.pdf>

² Available Online: A Desk-top Method for Establishing Environmental Flows in Alberta Rivers and Streams. Updated April 1, 2011. <https://open.alberta.ca/publications/9780778599791>

³ Available Online: Guide to Compelling Reasons to not take the 10% Holdback for Water Transfers within the SSRB (GoA, 2015). <https://open.alberta.ca/publications/esrd-water-quantity-2015-no-1>

likely be implemented as minimum release criteria/conditions, potentially enabling the transfer of the requested volumes without the 10% WCO holdback.

Alberta Desktop Method and DFO Ecological Flow Framework

In response to IR 6.13 (CIAR #313), Benga stated that Project impacts on Gold Creek are within the 15% limit of the Alberta Desktop Method and the 10% limit of the 2013 DFO Ecological Flow Framework, and indicated that even without releases from the saturated backfill zone, flows in Blairmore Creek would remain at baseline levels. However, Benga has not clearly explained how flows in Blairmore Creek would remain at baseline levels without releases from the saturated backfill zone given the sizable Project footprint in the Blairmore Creek watershed.

Both the Alberta Desktop Method and the DFO framework include Ecosystem Base Flow (EBF) components that define critical flow thresholds below which there should be no Project impacts on flows.

Therefore, to be consistent with these approaches and to ensure that the licences will have no significant adverse effects on the aquatic environment, the licences will likely require specific minimum release criteria when Gold Creek and Blairmore Creek are not meeting the requirements of either the DFO framework or the Alberta Desktop Method, with respect to both the maximum percent reduction and EBF requirements.

Benga has provided the EBF using the Alberta Desktop Method, which are the Q80 values in Addendum 11, IR 6.13 (a) (CIAR #313). However, Benga has not used this information to calculate a minimum release rate from the Project.

The EBF using the DFO framework is defined as 30% of the mean annual discharge in each creek. Benga has provided the mean annual discharges to be 0.669 m³/s in Gold Creek and 0.235 m³/s in Blairmore Creek. The EBFs using the DFO framework are therefore 0.201 m³/s in Gold Creek and 0.071 m³/s in Blairmore Creek. The EBF minimum release rate will likely be required to be proportional to the Project footprint in each creek's watershed, as illustrated in the sample calculations provided later in this request.

Finally, to meet the minimum release requirement when the Crowsnest River is below its WCO, Benga is likely to be required to release a volume equal to the daily equivalent of the 185,022 m³ annual allocation (about 500 m³/day). It should be noted that any release into either Blairmore Creek or Gold Creek to meet minimum release criteria for these creeks can count towards meeting the WCO on the Crowsnest River.

Water Quality Environmental Protection and Enhancement Act (EPEA) Targets

As Benga has consistently stated that it will not discharge water from the saturated backfill zone to Gold Creek and Benga's environmental assessment is based on this approach, Benga should anticipate that, if approved, the Panel will likely include a condition prohibiting release of water from the saturated backfill zone to Gold Creek.

In response to IR 5.3 (CIAR #251), Benga has also stated that if water from the saturated backfill zone cannot meet EPEA water quality release standards, it will re-direct this water to the saturated backfill zone or the raw water pond. Therefore, Benga will need to be able to meet the minimum release criteria using water that can reliably be expected to meet EPEA criteria, such as water stored in the sedimentation ponds.

Request for additional information:

- a) Explain in detail how Benga concluded that without releases of water from the saturated backfill zone, flows in Blairmore Creek would remain at baseline levels;
- b) Confirm that Benga can commit to limit Project impacts on flows in Blairmore Creek to less than 10% without any release of water from the saturated backfill zone; and
- c) Confirm and provide a detailed justification to demonstrate that the Project has sufficient water storage capacity from sources other than the saturated backfill zone to support the following minimum daily releases for Gold Creek, Blairmore Creek, and the Crowsnest River. As part of the justification, estimate the amount of time per year when these minimum release requirements are expected to be in place (considering the changes in land use and on-site water storage over the life of the mine). If the Project will not have sufficient water from sources other than the saturated backfill zone to satisfy these requirements, explain what alternatives will be pursued by Benga.

i. Gold Creek Ecosystem Base Flow:

$$\text{Minimum Release Rate} = Q_{GC} \frac{A_{mine,GC}}{A_{GC}}$$

- a. DFO Framework, when flow in Gold Creek is less than 0.20 m³/s
- b. Alberta Desktop Method, when flow in Gold Creek is less than the weekly Q80

ii. Blairmore Creek Ecosystem Base Flow:

$$\text{Minimum Release Rate} = Q_{BC} \frac{A_{mine,BC}}{A_{BC}}$$

- a. DFO Framework, when flow in Blairmore Creek is less than 0.07 m³/s
- b. Alberta Desktop Method, when flow in Blairmore Creek is less than the weekly Q80

iii. Crowsnest River WCO:

When flow in Crowsnest River at WSC 05AA008 is below the established WCO, minimum release rate = 500 m³/day, where the minimum release is the sum of releases to Gold Creek and Blairmore Creek.

Q_{GC} = flow at WSC station 05AA030, Gold Creek near Frank

Q_{BC} = flow at Blairmore Creek near the mouth

A_{Mine,GC} = disturbance area of mine within Gold Creek Watershed

$A_{\text{Mine,BC}}$ = disturbance area of mine within Blairmore Creek Watershed

A_{GC} = Area of Gold Creek watershed at WSC station = 63.3 km²

A_{BC} = Area of Blairmore Creek watershed near the mouth = 48.1 km²