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OUR FILE No. 154436 /IMO

YOUR FILE No. 80101

October 24, 2019

**EMAIL TO [IAAC.grassymountain.AEIC@canada.ca](mailto:IAAC.grassymountain.AEIC@canada.ca)**

Grassy Mountain Coal Joint Review Panel  
Canadian Environmental Assessment Agency  
160 Elgin Street 22nd Floor  
Ottawa Ontario K1A 0H3

**Attention: Tracy Utting, the Acting Review Panel  
Manager**

Dear Ms. Utting:

**Re: Grassy Mountain Coal Project, Reference #80101**  
**Clients: Coalition of Alberta Wilderness Association and Grassy Mountain Group; and**  
**Shirley Kirby**  
**Comments on Benga Mining Limited's Environmental Impacts Assessment**

As indicated in our earlier correspondence of January 21, 2019, we act for Ms. Shirley Kirby and the Coalition of Alberta Wilderness Association and Grassy Mountain Group ("the Coalition").

On September 9, 2019, the Joint Review Panel initiated a public comment period inviting the public to comment on the additional information submitted by Benga Mining Limited ("Benga") in relation to the Environmental Impacts Assessment ("EIA") for the Grassy Mountain Coal Project. The Coalition has reviewed the EIA and the additional information provided and questions the adequacy and the technical merits of the EIA. In the Coalition's view, the submitted EIA is inadequate and requires further process.

In our January 21, 2019 letter, the Coalition informed the Joint Review Panel about the experts that it had retained on the various aspects of the EIA and provided their comments/information requests. The Coalition has retained additional experts to review the economic impacts and benefits of the project (Mr. John Thompson), the risk of selenium arising from the project (Dr. Tariq Siddique), water quality and climate change impacts assessment (Dr. Jon Fennell), and the project's impacts to cutthroat trout.

Mr. Thompson has prepared information requests relating to the economic impacts and benefits of the project. The information request is attached at **Tab A**.

Dr. Jon Fennell has prepared comments on the EIA relating to climate change impacts. Dr. Fennell's commentary is attached at **Tab B**.

Mr. Allan Locke, previously retained expert on inflow stream needs assessment, has prepared comments on the additional information from Benga. Mr. Locke's commentary is attached at **Tab C**.

The Coalition requests that the Joint Review Panel consider the comments provided by the Coalition in its review of Benga's EIA. The Coalition further requests that the Joint Review Panel direct Benga to provide responses to the information requests submitted by the Coalition.

Yours truly,

**ACKROYD LLP**

*<Original signed by>*

IFEOMA M. OKOYE

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Enclosures

## Proposed Information Requests on the Sufficiency and Technical Merit of the Environmental Assessment

**Participant:** John Thompson, Watrecon Consulting

**Organization (if applicable):** Coalition of Alberta Wilderness Association and Grassy Mountain Group

**General Comments:** The economic impacts assessment provided in the application and the supporting reports are inadequate.

## Proposed Information Requests on the Sufficiency and Technical Merit of the Environmental Assessment

Information Source <i>(section or page# of EIS, Addenda, Responses to Requests for Information, etc.)</i>	Rationale	Proposed Information Request
<p>Guidelines of the Preparation of and Environmental Impact Statement:</p> <p>Under Section 3.3.3, the temporal boundaries of the EA will span all phases of the Project determined to be within the scope of this environmental assessment as specified under section 3.1 above</p> <p>Application:</p> <p>In Consultants Report #11, prepared by Nichols Applied Management, Section 1.1, Project Description, it states that, “For the purpose of this</p>	<p>Observation:</p> <p>The project timing is no longer valid and there is more recent socio-economic baseline data for the study area.</p> <p>Rationale:</p> <p>Economic conditions have changed since the baseline was done. While the population has increased between 2011 and 2016 (by 1.7%), it is older but there has been an influx of families with children. With the population increase, there has been a slight increase in the size of the labour force (55 people) but there were 70 less employed people and 110 more unemployed workers, indicating that economic conditions have deteriorated. However, all of the improvements in economic conditions occurred on the BC side of the RSA. The number of people employed in the mining, quarrying and oil and gas industries declined by 20 overall, but this was based on an increase of 50</p>	<p>Could the applicant please provide an updated assessment of the project’s socio-economic effects based on its most recent estimates of the timing of project construction, operation, decommissioning and abandonment of the project in the context of current social and economic conditions in the regional study areas, which includes the 2016 Census and other recent relevant socio-economic conditions, and other planned and proposed major projects that could occur at the same time.</p>

## Proposed Information Requests on the Sufficiency and Technical Merit of the Environmental Assessment

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<p>assessment, the following schedule has been assumed:</p> <ul style="list-style-type: none"> <li>• construction of the Project starting in Q1 2018 and ending in Q3 2019; and</li> <li>• operations start-up in Q3 2019</li> </ul> <p>Furthermore, the economic baseline used for assessing project effects is the 2011 census.</p>	<p>in BC and a loss of 70 in Alberta. This means that there are likely to be fewer opportunities for local employment in Alberta than previously estimated, so more people moving into the communities with potential for a larger increase in population and higher demands on social and other services.</p>	
<p>Content of the Environmental Impact Statement:</p> <p>Section 2.1 requests that “The EIS also will describe the predicted environmental, economic, and social benefits of the Project.”</p> <p>Application:</p> <p>Section of the A.2 of the Application provides a list of the proposed benefits:</p> <ul style="list-style-type: none"> <li>• receipt of revenue in the form of production</li> </ul>	<p>Observation:</p> <p>However, with the exception of royalties and taxes, which are described in Sections 4.4.1 and 4.4.2 of Consultants Report #11, these benefits are not quantified. Furthermore, these estimates are based on capital and operating costs that are likely outdated.</p> <p>Reasoning:</p> <p>Aside from the project costs and benefits having changed since the application was filed, the list of project benefits is too general to support a conclusion that possible benefits might outweigh any significant adverse environmental or socio-economic impacts. In fact, the suggestion that there will be employment benefits is negated by the conclusions in Consultants Report #11 that project effects on employment are predicted to be not significant. Consultants Report #11 (p 19)</p>	<p>Could the applicant please provide an updated assessment of the project’s costs for all four projects phases, including details of estimated purchases of labour, goods and services from the RSA, other Alberta, Canada and elsewhere?</p> <p>Could the applicant provide an updated estimate of local, provincial and federal government revenues (royalties and taxes) on an average annual basis?</p>

## Proposed Information Requests on the Sufficiency and Technical Merit of the Environmental Assessment

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<p>royalties, licence fees and taxes by municipal, provincial and federal governments;</p> <ul style="list-style-type: none"> <li>• a material diversification of revenue for both the municipal and provincial governments given the limited metallurgical coal developments in the Crowsnest Pass and Alberta;</li> <li>• material economic development in southwest Alberta, an area that is trailing the remainder of Province economically;</li> <li>• use of goods and services provided by local, regional and provincial contractors and retailers;</li> <li>• opportunities for Alberta and Canadian (with a focus on the local public and Aboriginal Groups) engineering firms, contractors, manufacturers and suppliers to compete in</li> </ul>	<p>also notes that its assessment of provincial fiscal benefits are not net of potential costs to the province of social and physical infrastructure investment driven by industry expansion.</p>	<p>Could the applicant quantify or provide more details of the other project benefits described in Section 2.1 of its application and describe what, in its opinion, represents a “material” change in social and economic conditions.</p> <p>Could the applicant describe and quantify the costs of any social and physical infrastructure investments that would be expected to be made by provincial or municipal governments in support of the project?</p>

## Proposed Information Requests on the Sufficiency and Technical Merit of the Environmental Assessment

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<p>the supply of goods and services;</p> <ul style="list-style-type: none"> <li>• employment which includes skilled, well paid, full time positions; and</li> <li>• development of the Project in an environmentally responsible manner and one that allows the full rehabilitation of the Grassy Mountain area at the conclusion of the project in a fashion that is much more sustainable long term than prior mining in the area has currently left it.</li> </ul>		
<p>Content of the Environmental Impact Statement:</p> <p>Section A.2 of the Application explains the project need in terms of world demands for steelmaking coal based on market forecasts based on conditions in 2015.</p> <p>Application:</p>	<p>Observation: World markets may have changed since 2019 and so may have the expected prices for coal, which may affect the economic viability of the project.</p> <p>Reasoning:  The response might warrant having an expert review the forecasts to determine whether the applicant's assumptions are valid.</p>	<p>Could the applicant please provide an updated assessment of the potential world market for steelmaking coal over the proposed life of the project including price forecasts used to support the financial analysis of its project?</p>

## Proposed Information Requests on the Sufficiency and Technical Merit of the Environmental Assessment

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<p>Section 2.1 states: The EIS will describe the purpose of the Project by providing the rationale for the Project, explaining the background, the problems, or opportunities that the Project is intended to satisfy, and the stated objectives from the perspective of the proponent</p>		
<p>Content of the Environmental statement: Section 2.2 requests that “The EIS will identify and consider the effects of alternative means of carrying out the Project that are technically and economically feasible. The proponent will complete the following procedural steps for addressing alternative means:</p> <ul style="list-style-type: none"> <li>• identify the alternative means to carry out the Project;</li> <li>• identify the effects of each technically and economically feasible alternative means.”</li> </ul> <p>Application:</p>	<p><i>Observation:</i></p> <p>At no point is the financial feasibility of the project as proposed ever described. Section A.7 notes that the project’s Feasibility Study was used to consider a variety of mine plan development plans. However, there is no evidence in the application that shows the extent to which economic feasibility would be changed as a result of alternative means. In the absence of more detailed descriptions of economic feasibility, the Applicant is asking the Review Panel to take its word that the alternatives are not feasible.</p> <p><i>Reasoning:</i></p> <p>The current application lacks sufficient detail for the Panel to understand the economic feasibility of alternatives means of carrying out the project. There is a risk that the Applicant could argue that financial information is proprietary and not for public release. But this leaves the door open for questions about how the Applicant can be trusted if it won’t provide key information needed to assess project risk.</p>	<p>Could the applicant please provide its most recent Feasibility Study as this information is necessary to understand the economic implications of Alternative means in quantitative terms as well as how the estimates of provincial and federal royalty and tax revenues were calculated?</p>

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<p>A Project Alternative Means Assessment was provided in Section A.7 of the Application and purports to have assessed the economic feasibility of alternative means in terms of construction/capital cost, operating cost, schedule risks and impact on community, using a 4-point ranking scale.</p>		
<p>Guidelines of the Preparation of and Environmental Impact Statement:</p> <p>Section 4.1 states that “For each VC, the EIS will describe the methodology used to assess project-related effects. The EIS will document how scientific, engineering, traditional, and local knowledge were used to reach conclusions. Assumptions will be clearly identified and justified. All data, models, and studies will be documented such that the analyses are transparent and reproducible. All data collection methods will be specified. The uncertainty, reliability, and sensitivity of models used to reach conclusions must be indicated.</p> <p>Application:</p>	<p><i>Observation:</i></p> <p>There is no indication of what “published statistics” were used or what sort of modelling was done to derive the “benefit” estimates being used to justify the project.</p> <p><i>Reasoning</i></p> <p>I assumed that the impacts were modelled using published multipliers that were derived for “average” industry conditions in the base year of the input-output model and more updated multipliers are now available and no one is sure what an “average” project in a given industry actually is. Consequently, there is considerable room for error. Furthermore, by asking for the estimates of direct impacts, this information can be used to derive a realistic estimate of actual project benefits.</p>	<p>Could the Applicant please describe the actual methodological approach used to estimate the project’s impacts on GDP, employment and labour income, in Alberta and BC and provide detailed estimates for each of the direct, indirect and induced effects in addition to total effects? If modelling was done, please indicate what model (and base year) was used, what inputs were used to shock the model, and what leakages were assumed. This information needs to be in sufficient detail so that the calculations can be reproduced.</p> <p>Can the Applicant please provide an updated estimate of project impacts using updated cost information for each of the four phases of the project?</p>



## Proposed Information Requests on the Sufficiency and Technical Merit of the Environmental Assessment

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<p>In Consultants Report #11, prepared by Nichols Applied Management, it is stated in Section 4.3 that the project's impacts on GDP and labour income were estimated using published statistics while Section 2.5 states that these effects were estimated using economic input-output modeling of the Alberta and B.C. economies</p>		
<p>Guidelines of the Preparation of and Environmental Impact Statement:</p> <p>Under Section 3.2, Factors to be considered include the "environmental effects of the Project, including the environmental effects of malfunctions or accidents that may occur in connection with the Project and any cumulative environmental effects that are likely to result from the Project in combination with other physical activities that have been or will be carried out; and the significance of effects.</p> <p>Application:</p> <p>Section C.9 of the Application examines the risk and potential</p>	<p><i>Observation:</i></p> <p>There is no discussion of the "significance " of these events, although this could be equated to risk. There is no definition of what the terms used to describe likelihood and magnitude actually mean.</p> <p><i>Reasoning</i></p> <p>If we are to do a proper benefit/cost analysis, we need to factor the potential economic costs of accidents into the calculations. This would be the annual probability of each type of accident multiplied by the potential cost. A 1% probability event with a clean-up cost of \$20 million represents an annual \$0.2 million project costs that would offset some of the benefits.</p>	<p>Could the applicant please provide a description of how it defines the likelihood of unlikely and rare accidents in terms of annual probability? Could the applicant please describe the terms used to describe the magnitude of accidents (low, moderate and high) in terms of the economic costs associated with each type of accident?</p>

## Proposed Information Requests on the Sufficiency and Technical Merit of the Environmental Assessment

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effects of accidents and malfunctions and the results are summarized in Table C.9.10-1 and include an assessment of the resulting risk.		
<i>Please use as many pages as necessary.</i>		

October 16, 2019

Ifeoma Okoye  
Ackroyd LLP  
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**Re: Review of Climate Changes Aspects related to the Grassy Mountain Coal Project Application**

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Pursuant to your request, the following is a listing of concerns regarding how climate change aspects were not sufficiently dealt with in the Grassy Mountain Coal Project application submitted by Riverdale Resources, Benga Mining Limited. Documents reviewed during this review process included:

- Section C: Project Description, August 2016 (Riverdale Resources, Benga Mining Limited)
- Section E: Environmental Impact Assessment Summary, August 2016 (Riverdale Resources, Benga Mining Limited)
- Grassy Mountain Surface Hydrology Baseline and Effects Assessment (SRK Consulting (Canada) Inc., 1CM029.011, August 2016)
- Grassy Mountain Coal Project – Hydrogeology (Millennium EMS Solutions Inc. File #14-00201-01, August 2016)
- Addendum 9: Grassy Mountain Coal Project Joint Review Panel Request for Additional Information – Traditional Land Use, January 2019 (Riverdale Resources, Benga Mining Limited)
- Addendum 10: Joint Review Panel Request for Additional Information Response Package – Package 5: Surface Water Quality, Hydrology, Hydrogeology, Fish and Fish Habitat, Cumulative Effects, Geotechnical, Reclamation, Wildlife, Land Use and EA Methodology, August 2019 (Riverdale Resources, Benga Mining Limited)

The main concern with regards to the implications of climate change and this project is how it will affect the flow conditions in local rivers and streams (i.e. surface discharge and groundwater contribution). The applicant has indicated through their modelling effects that flow to local creeks assessed, in particular Blairmore and Gold creeks, will be intercepted by mine dewatering activities. As a result springs and groundwater baseflow contributing to the flow in these features will be impacted. Additionally, there is the risk of eventually capturing stream flow plus permanently altering the water balance of the area via the surface disturbance related to the mine workings.

Table 5.3-1, taken from Millennium's Hydrogeology report and provided on the following page, indicates a reduction in baseflow contribution to both Blairmore and Gold creeks as a result of the

mine dewatering activities. The average modelled reductions are 26% and 12%, respectively, for the End-of-Mine (EOM) scenario, and 9% to 6%, respectively, for the Long-Term Closure (LTC) scenario.

<b>Watershed</b>	<b>Station</b>	<b>Base flow Reduction (EOM)</b>	<b>Base flow Reduction (LTC)</b>
Blairmore Creek	BL-03	0%	0%
	BC-07	23%	13%
	BL-02	25%	16%
	<b>BC-03</b>	<b>30%</b>	<b>11%</b>
	BC-01	27%	10%
	<i>Average</i>	26%	9%
Gold Creek	GC-13	10%	10%
	GC-09	13%	11%
	GC-04	10%	9%
	<b>GC-02</b>	<b>19%</b>	<b>18%</b>
	GC-01	12%	6%
	<i>Average</i>	12%	6%
Daisy Creek	D1	0%	0%
Crowsnest River	CR-01	0%	0%

Data from the numerical model (Appendix C)  
**Bold: stations with maximum base flow reduction**

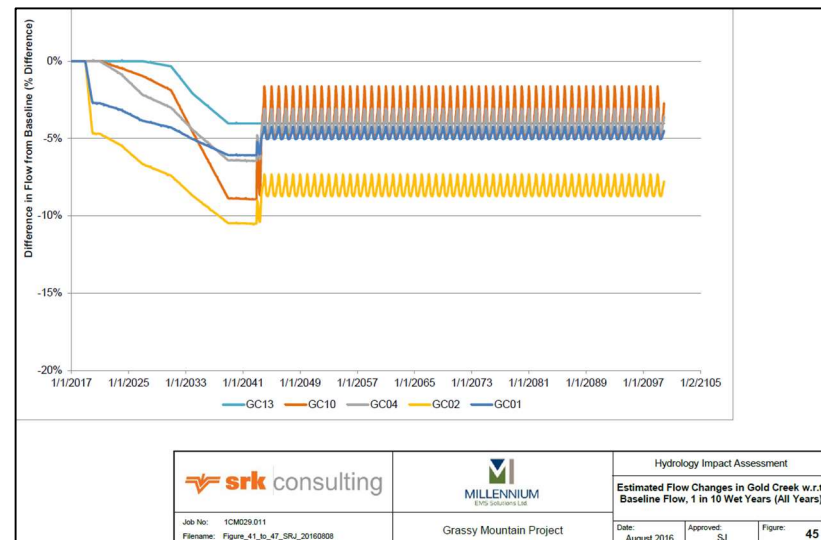
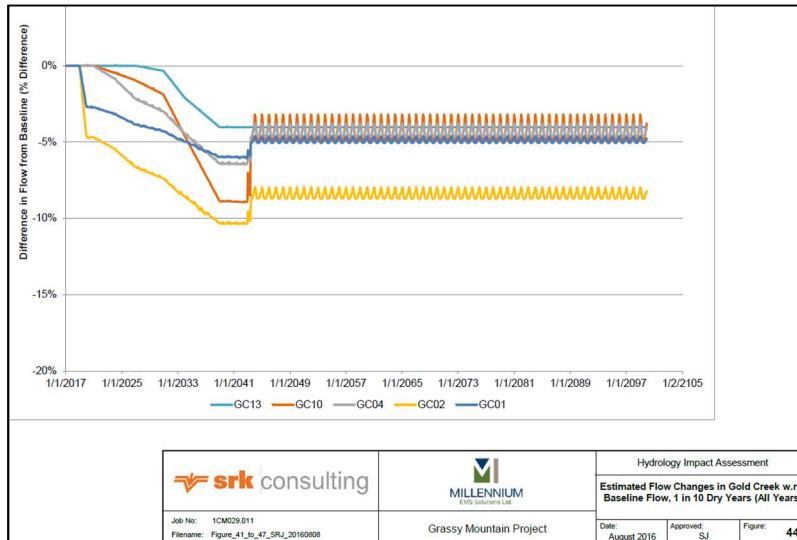
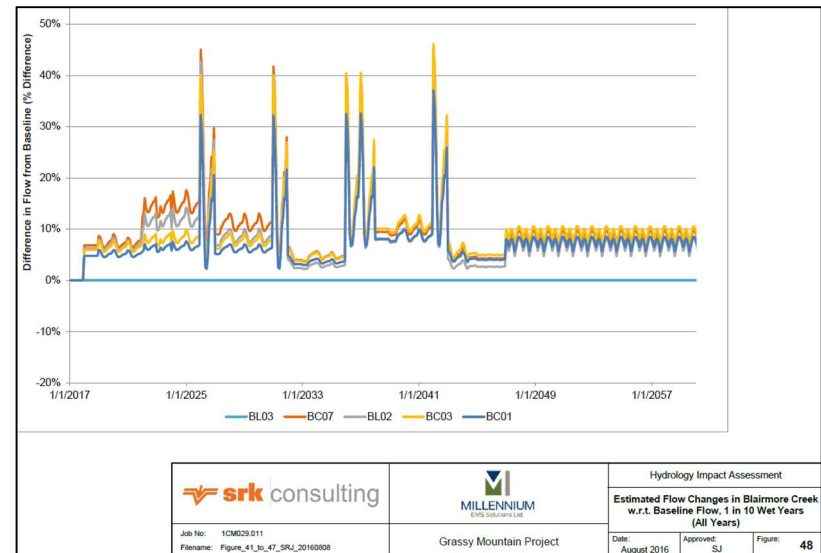
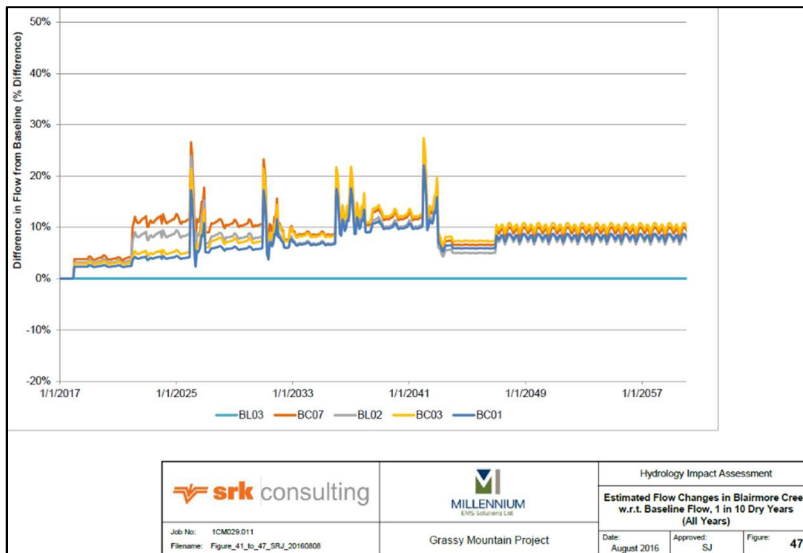
During this assessment by Millennium, the valued components (VCs) identified and considered in the assessment of streamflow impacts include:

- Effect on high, mean and low flows on Blairmore Creek during the operations phase and after closure;
- Effect on high, mean and low flows on Gold Creek during the operations phase and after closure; and
- Effect on sediment concentration on Blairmore Creek and Gold Creek during the operations.

One crucial VC that is not included in this assessment is:

- Effect on sensitive terrestrial and aquatic ecosystems reliant on the maintenance of a shallow water table and discharge of nutrient-rich and temperature regulated groundwater.

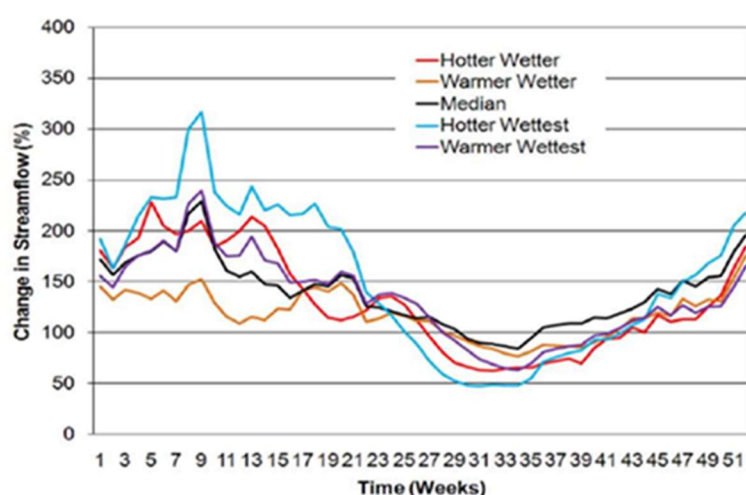
Estimated changes to flow conditions in Blairmore and Gold creeks for both dry and wet years were also assessed to accommodate some degree of variability in the climatic conditions. Both the wet and dry model scenarios assumed that each year in the model scenario was a 1 in 10 dry year or a 1 in 10 wet year, respectively. Interestingly, the results of this assessment indicate an increase in flow for Blairmore Creek under both wet and dry scenarios ranging anywhere from +5% to +45%, depending on location. Conversely, reductions in flow for Gold Creek ranging from -2% to -11% are noted, again depending on location. Results of these model simulations are provided in Figure 1 on the following page.



**Figure 1.** Simulated impacts to Blairmore Creek (upper charts 47 and 48) and Gold Creek (lower charts 44 and 45) in response to 1 in 10 dry and wet years.

Although this attempt at accommodating some form of climate variability into the impact assessment is used to frame the risk to local creeks, it falls short of fully assessing the implications of climate change, per se, and how this might affect ecosystems and aquatic organisms reliant on sufficient flow throughout the year (i.e. temperature regulation, nutrient transfer).

Research conducted by Sauchyn et al. (2011) in a headwater basin located north of the Grassy Mountain project area indicates that simulated flow conditions under various future climate conditions are anticipated to shift in both timing and magnitude (Figure 2). As such, more flow (roughly +50% to +200% of the 1961-1990 baseline period)) is anticipated in the early season due to a shorter winter season and more frequent rain-on-snow events. This is followed by an extended period of lower flow (roughly -10% to -50% of the 1961-1990 baseline period) during the summer months. An enhanced reduction in summer-time flow will have implications for ecosystems reliant on sufficient flows during that time of year.



**Figure 2.** Simulated Change in Streamflow for The Upper North Saskatchewan River Under Five Different Climate Scenarios. Note: Streamflow of 100% represents the 1961-1990 baseline.<sup>1</sup>

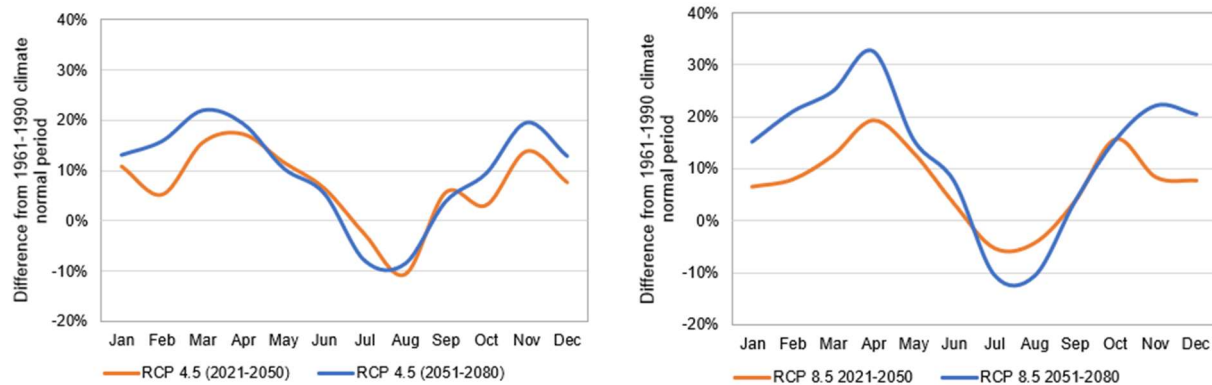
Review of climate model projections from the Climate Atlas of Canada: Version 2 (for the Blairmore area specifically (downscaled to 10 x 10 km grid cells) also indicates a shift in seasonality with respect to precipitation – the dominant contributor to stream flows.<sup>2</sup> An assessment of this changes, using the ensemble average of 24 bias-corrected (BCCAQv2) climate models. The results are shown in Figure 3 for both the representative concentration pathway scenarios RCP 4.5 (moderate) and RCP 8.5 (more extreme) for the future time periods 2021-2050 and 2051-2080. Informative summaries regarding details of the two RCP scenarios is available at the following websites:

<https://www.environment.gov.au/system/files/resources/492978e6-d26b-4202-ae51-5eba10c0b51a/files/wa-rcp-fact-sheet.pdf>

<https://www.cicero.oslo.no/en/posts/news/a-guide-to-representative-concentration-pathways>

<sup>1</sup> Sauchyn et al. 2011

<sup>2</sup> <https://climateatlas.ca/>



**Figure 2.** Climate model projections for seasonal precipitation under RCP 4.5 and RCP 8.5 scenarios.

From a review of Figure 2 it is apparent that a shift to higher precipitation earlier in the year is projected to occur followed by a reduction to the amounts of summer time precipitation. Unfortunately, this particular aspect of the anticipated change to seasonal precipitation has not been accommodated either in the Hydrology or Hydrogeology assessments conducted by SRK and Millennium. This leaves a critical piece of the impact assessment process unanswered creating concern among First Nations peoples and local residents regarding the adverse affect of this mine development on valued ecological goods and services.

As such, the implications to streamflow conditions under this shift in seasonality of precipitation needs to be considered when assessing the impact to stream flow and the associated ramifications for fish, fish habitat, and groundwater dependent ecosystems. It is therefore recommended that this aspect be included in the impact modelling to frame the risk and avoid unintended consequences prior to any further processing of the application.

## Closure

I trust the preceding comment outline the concern raised regarding how certain aspects of the climate change assessment have not been considered in this EIA. If you have any questions, or require further clarification on the content provided, please contact me at your convenience.

Respectfully,

<Original signed by>

Jon Fennell, M.Sc., Ph.D., P.Geol.  
Water Security & Climate Change

## References

Sauchyn D., Byrne J., and S. Kienzie (2011). *Past, Recent and Future Hydroclimatic Variability, North Saskatchewan River*. Final Report on an EPCOR – NSERC Collaborative Research and Development Project, January 2011.

## Websites

Prairie Climate Centre. *Climate Atlas of Canada version 2 (July 10, 2019), using BCCAQv2 climate model data*. <https://climateatlas.ca/>, Accessed September 17, 2019



**Joint Review Panel Request for Additional Information Response Package Addendum 10**  
**A. Locke Comments**  
**October 2019**

**Specific Comments**

**Information Request 5.25**

On page 135 it is stated:

*“In Section 5 of the Instream Flow Assessment in Appendix A3 in Addendum 1 (CEAR #44), Benga stated that short-term mitigation measures have been proposed for supplementing flows during dry years, which are intended to alleviate any elevated risk of causing incremental residual effects to critical habitat. In response to concerns outlined by the Coalition (CEAR #191), Benga stated that flow supplementation, and other adaptive water management techniques, would be considered as part of the Water Management Plans developed during the permitting stage. Details regarding how flow augmentation of Gold Creek during periods of reduced flows will be implemented were not provided for consideration. Given the threatened status of WSCT, details regarding the proposed mitigation must be provided for the Panel’s consideration, and not at a later time.*

*Response:*

*Additional detail on flow supplementation as a mitigation measure was provided in response to DFO’s SIR#2 included in the Sixth Addendum to the Environmental Impact Assessment (CEAR #70). Predicted habitat alterations/loss due to changes in hydrology are small and hydrological conditions are highly variable, therefore it is proposed that ongoing hydrologic and habitat monitoring be performed as part of the Project’s Fisheries and Aquatics Monitoring Program to verify modelling predictions and identify whether upper Gold Creek may require flow augmentation (draft provided in JRP IR-5.4, Section 6.1).”*

In addition to what the proponent states, “Flow supplementation, and other adaptive water management techniques, would be considered as part of the Water Management Plans developed during the permitting stage”, there needs to be an understanding of the **requirement** to develop a water management plan reflected by a clear and unequivocal statement such as, “Prior to the issuance of any licences or permits, a Water Management Plan must be developed. This will be a process that is led by the Governments of Canada (*Fisheries Act, Species at Risk Act*) and Alberta (*Water Act*) pursuant to their respective legislation. This process will involve the provincial and federal governments, the proponent, and all interested stakeholders.”

## General Comments

The proponent did not provide direct responses to most of the specific comments that were provided in January of this year. However, it is noted the proponent responded to other groups regarding: instream flow science, presumptive instream flow standards, the logistics for providing instream flows, existing Instream Objectives, existing Water Conservation Objectives, and the specifics of water licencing requirements, which addressed in part, several of my comments and questions. The proponent states, “*...flow supplementation, and other adaptive water management techniques, would be considered as part of the Water Management Plans developed during the permitting stage...*” In general, it is understood the process of water management planning includes the review and acceptance of the instream flow science developed by the proponent, the evaluation of alternative water management regimes, and the setting of Instream Flow Objectives, which leads to the development of a cabinet approved water management plan. However, given it is not certain this process would take place during a permitting stage after the Joint Panel Review process, it is requested the Proponent provide direct responses to the Coalition’s questions and comments at this point in time.