Joint Review Panel Request for Additional Information Response Package
Addendum 10

Package 3: Geotechnical and Dam Safety, Land Use and Land Management

Benga Mining Limited
Grassy Mountain Coal Project

July 2019

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GEOTECHNICAL AND DAM SAFETY

3.1 Information Request 3.1

Eighth Addendum to the Environmental Impact Assessment. Appendix A.3 - Conservation and Reclamation. (CEAR #89).

Benga was asked to provide additional pit wall stability analyses results that include the impact of the North Rock Dump on the stability of the Western Pit Endwall (Section B) and Central Pit Highwall (Section D). In response to AER-R2-88 (CEAR #89), Benga provided the stability analysis along Section B with a factor of safety of 1.17 (Figure AER-R2-88-4) and 0.98 (Figure AER-R2-88-5) under global static and seismic loading conditions, respectively.

In Table B.8.6-5 of Section B of the EIA, Benga presents the Minimum Design Factors of Safety that are applicable to the overall stability of the highwall under static and seismic loading conditions. These Minimum Design Factors of Safety are 1.3 to 1.5, and more than 1, respectively under status and seismic loading, as based on the British Columbia Mined Rock and Overburden Piles Investigation and Design Manual. The calculated factors of safety for the Western Pit Endwall in Benga's response to AER-R2-88 are lower than the recommended values for both static and seismic loading conditions.

Benga has not provided an explicit rationale for adopting lower factors of safety than the Minimum Design Factors of Safety in Table B.8.6-5 of the EIS. It remains unclear whether risk of slope failure at the Western Pit Endwall is adequately managed.

a) Provide the rationale for adopting a lower factor of safety (static and seismic) for the stability of the Western Pit Endwall that includes the impact of the North Rock Dump.

b) Describe and discuss the risk involved in case of failure and how the risk will be managed.

c) Explain what would be required from Benga to achieve the minimum design factors of safety in the Project design and any associated implications for Project construction and operation.

Response:

The following provides a fulsome response to Parts a to c of this information request regarding Factors of Safety.

Introduction

As part of the detailed engineering for the Project, Benga has requested SRK Consulting (Canada) Inc. (SRK) to carry out detailed stability analyses for the North Endwall and Highwall pit slopes for the Grassy Mountain Project. The pit slope analyses included the North Rock Dump located to the north/northwest of the pit crest. The stability analyses work was carried out using two numerical methods, Limit-equilibrium (LE) program Slide and the Finite-element (FE)

program RS2. These methods are industry recognized, and the use of multiple programs is acknowledged to improve reliability for the respective results.

Informed by the screening-level stability analyses, previously conducted during the development of the EIA phase, further evaluation of modelling input parameters (*i.e.,* 3D geological model, rock strength, groundwater) was conducted using the field and laboratory data collected from 2015 to 2019. This evaluation of the input parameters supported improved reliance for the modelling inputs.

Approach:

Two sections were selected to represent the rock mass and structural geology (*i.e.,* fault) conditions through the North Endwall and North Highwall (Figure 3.1-1). These sections were also selected to represent the highest slopes and where the toe of the proposed waste rock dump is located close to each pit wall. The geology associated with the endwall and highwall section are shown in Figure 3.1-2 and Figure 3.1-3, respectively.

As detailed, numerical modelling methods were carried using Slide and RS2 programs. The stability analyses modelled a potential overall non-circular failure through the anisotropic rock mass (*i.e.,* bedded, jointed rock) and the continuous fault structures (*i.e.,* plausible rock failure mechanisms). A static analysis refers to the modelling of materials at the point of failure, while a pseudo-static analysis also considers a horizontal force from a seismic event using a Peak Ground Acceleration (PGA) based on a site-specific earthquake event.

Unlike some engineered soils, rock slopes are not affected by earthquake seismic loading. There has been no recorded overall slope instability events at mine operations internationally due to the force produced by a nearby earthquake. During operations, blast energies will have a greater effect on rock than a low-probability earthquake event and this rock mass damage aspect has been accounted for in the modelling work (Figure 3.1-2 and Figure 3.1-3). However, for comparison with the screening level results, a pseudo-static analysis was completed for the North Highwall.

With the screening level analyses indicating that groundwater may have an influence on stability, several groundwater scenarios were completed to test the stability sensitivity to pore water pressure. The groundwater conditions were supported by the 3D hydrogeological modelling work (SRK, 2016) and considered annual infiltration, groundwater levels measured from nearby vibrating wire piezometers (VWP's) and conductivity properties from hydraulic testing (Golder, 2015). The following groundwater scenarios were modelled:

- Phreatic surface approach that utilizes a water elevation from nearby vibrating wire piezometer (VWP) monitoring, and a drawdown that coincides with the blast-induced fracture zone located 30 m behind the slope face (Figure 3.1-4).

- Steady-state pore water pressure model (PPM) approach that represents the infiltration, conductivity and predicted groundwater response to mining at the completion pit slope excavation (Figure 3.1-5).
- An r_u coefficient method using a value of 0.15. The r_u method is considered to be representative of the natural dewatering of the sedimentary rock slopes (SEIS, Section B, CEAR#42) and is based on the results of the 2014 hydrogeological investigations and observations in the nearby Elk Valley (EIS, Section B, CEAR#42).

The slope depressurization will be further enhanced by the 3D effect of the excavation of the adjacent pit slopes exposed in this area (Figure 3.1-1). For example, the excavation of the North Highwall will support the draw-down of groundwater behind the North Endwall, and vice versa. Therefore, more beneficial slope depressurization conditions can be expected with comparison to the modelled groundwater scenarios.

Acceptance Criteria:

Stability acceptance criteria presented in the Guidelines to Open Pit Slope Design publication (Read and Stacey, 2009) is the most recognized international standard for pit slope stability and design assessment (Table 3.1-1). The criteria are based on a pit scale (including bench, inter-ramp and the overall slopes) and possible failure consequence approach. The criteria include Factor of Safety (FOS) and Strength Reduction Factor (SRF) for static and pseudo-static conditions. For the Grassy Mountain Project, a minimum acceptable FOS/SRF of 1.3 was considered appropriate given the significant pit slope heights along the North Endwall and Highwall, and a considered high level of consequence from an overall slope failure.

An SRF is considered equivalent to a FOS. The SRF is calculated using the FE method by successive reductions in the intact rock and bedding/joint strengths until a critical failure surface through the materials can be established (with a resulting SRF). The modelled SRF and FOS failure surfaces are then cross-checked to provide confidence in the analyses methods and results.

Table 3.1-1 Suggested Stability Design Criteria (Read and Stacey, 2009)

Pit Slope Scale	Consequence of Failure[1]	Static Analyses	Pseudo-static Analyses
		Minimum FOS/SRF[2]	Minimum FOS[2]
Bench	Low to high	1.1	n/a
Inter-ramp	Low	1.15 – 1.2	1.0
	Medium	1.2	1.0
	High	1.2 – 1.3	1.1

Table 3.1-1 Suggested Stability Design Criteria (Read and Stacey, 2009)			
Pit Slope Scale	**Consequence of Failure[1]**	**Static Analyses**	**Pseudo-static Analyses**
		Minimum FOS/SRF[2]	**Minimum FOS[2]**
Overall	Low	1.2 – 1.3	1.0
	Medium	1.3	1.05
	High	1.3 – 1.5	1.1

Notes: [1]- Consequence of failure semi-quantitatively evaluated, [2] – SRF = Strength Reduction Factor, FOS = Factor of Safety.

Results:

The results of the LE and FE stability analyses are summarized in Table 3.1-2. The results indicate that the modelled stability through Section 1 (North Endwall) and Section 2 (North Highwall) are expected to achieve a minimum design FOS/SRF of 1.3 for an inter-ramp/overall scale failure mechanism subjected to the respective groundwater scenarios. A failure surface that passes through the toe of the dump and pit slope will have a greater FOS/SRF than those indicated in Table 3.1-2.

A comparative pseudo-static LE analysis was completed for the North Endwall using the PPM scenario which represents the lowest FOS from the static results. A Peak Ground Acceleration of 0.13, representing a 2% probability for a 50-year return period, for the Grassy Mountain Project site is indicated by Natural Resources Canada (NRCAN, 2019). The result indicates a FOS of 1.2 for the North Highwall and 1.1 for the North Endwall, which meets the minimum acceptable value of 1.1 for an overall slope instability with a high consequence of failure (Table 3.1-1).

Figure 3.1-6 shows the FOS (limit equilibrium) result considering groundwater conditions calculated by the PPM. The finite element model and SRF result with the same groundwater conditions is shown in Figure 3.1-7.

Table 3.1-2 Summary of Slope Stability Analyses for Section 1 and 2

Modelled Scenario	Minimum Design FOS/SRF	Critical FOS/SRF			
		Section 1- North Endwall		Section 2- North Highwall	
		LE Analysis	FE Analysis	LE Analysis	FE Analysis
Dry Model	1.3	1.6	1.9	1.8	1.8
Phreatic Surface (Depressurized at Damage Zone)	1.3	1.3	1.6	1.4	1.6
Pore Pressure Model (PPM)	1.3	1.5	1.7	1.4	1.6
Ru = 0.15	1.3	1.4	-	1.5	-
Pseudo-Static Conditions (for PPM)	1.1	1.1	-	1.2	-

Note: Pseudo-static analyses carried using the PPM for North Endwall/Highwall as this scenario represented the lowest modelled FOS. Ru groundwater scenario is not an applicable approach for Finite Element computations.

The mine plan includes a phased pit excavation and subsequent waste rock backfilling. Following the completion of some pit phases, the excavation is to be backfilled with waste rock produced from the subsequent phase. With consideration to Section 1 through the North Endwall, approximately two-thirds of the pit slope will be buttressed, and backfilling is to commence a short time after completion of excavation. There is no backfilling planned for Section 2 through the North Endwall.

Monitoring and Geotechnical Slope Risk Management

With consideration to the stability analyses, the intact rock strength and groundwater inputs should be continually validated. For the North Endwall and Highwall area, further geotechnical investigations should be advanced behind the pit slopes to collect geotechnical data (*i.e.,* logging, laboratory testing) and for the installation of multi-sensor VWP's prior to nearby excavation.

The objective of the VWP monitoring is to record the groundwater response to excavation and compare against the inputs used in the analyses work. Should natural depressurization of the pit slopes be less than expected, consideration will be given to increasing the VWP monitoring network and installation of horizontal drain holes during the excavation of the benched slopes. New VWP's along with the existing three VWP's will form part of groundwater monitoring system at Grassy Mountain.

Other geotechnical pit slope data collection and monitoring approaches at Grassy Mountain will include:

- Regular geotechnical slope inspections by trained technical and mine operations personnel.
- Ongoing geotechnical data collection from the exposed benched faces to validate the rock mass conditions, structural geology and rock structures orientations. The structural geology model should be reviewed and adjusted with pit exposure and the results of infill drilling programs.
- Infilling drilling supported with geotechnical data collect activities, as above

A suitably qualified and experienced geotechnical engineer should carry out inspections at frequencies commensurate with the slope stability risks to review the performance of the pit slopes, design implementation and monitoring procedures.

3.2 Information Request 3.2

Grassy Mountain Coal Project - Updated Environmental Impact Assessment. Section C – Project Description. (CEAR #42).

Eighth Addendum to the Environmental Impact Assessment. (CEAR #89).

Environment and Climate Change Canada. Supplementary Information Request #11. Design Values for Extreme Precipitation. (CEAR #167).

Osler, Hoskin & Harcourt LLP. Benga Mining Limited's Reply to Comments. (CEAR #191).

Government of Alberta (2018). Alberta Dam and Canal Safety Directive.[1]

The Panel received comments from Environment and Climate Change Canada (ECCC) on whether the project de sign adequately accounted for predicted effects from climate change, especially for extreme precipitation events. Under topic #11 of ECCC's submission (CEAR #167), ECCC commented that Benga has not demonstrated that the current design of Project ponds is appropriate to accommodate short duration extreme precipitation events predicted by the climate models, such as those presented by Benga for one-day and five-day extreme precipitation events in response to ECCC-R2-1, Addendum 8 to the EIA (CEAR #89).

In response to ECCC's comment, Benga stated that the design of the dams for the ponds are based on the traditional standards-based approach provided in the Dam Safety Guidelines 2007 (2013 Edition) published by the Canadian Dam Association. Benga also noted that the effect of climate change on frequency-based target levels is not considered in the Dam Safety Guidelines, and therefore not typically considered in the design of dams in Canada (CEAR #191).

1 The Alberta Dam and Canal Safety Directive (2018) is publically available from: https://open.alberta.ca/dataset/93b2bded-f107-48e3-9eda-28acf2951822/resource/d01922c3-9464-4a6f-b2ca- 4fbcfa510864/download/directivedamcanalsafety-dec11-2018.pdf

Although the Dam Safety Guidelines do not explicitly consider the effect of climate change on frequency-based target levels, Section 5.5(d) of the Alberta Dam and Canal Safety Directive stipulates that the best available technology and best available practices in hydrologic and hydraulic science must be applied to estimate the inflow design flood and its characteristics.

As outlined in section C.9.5.3 of the EIA, the potential consequences from accidental release of water into the receiving environment can result in adverse environmental effects. Given this, the Panel requires additional information to confirm that best available practices have been incorporated into project design, and that the effects of short duration extreme precipitation events have been, or will be, incorporated into dam design.

a) Provide the rainfall duration associated with the design rainfall events for the dam classifications Significant (187.7 mm) and Very High (251.9 mm).

Response:

The rainfall duration associated with the design rainfall events for the dam classifications Significant and Very High are summarized as follows:

- Significant dam classification requires consideration of an event with a return period between 100 and 1000 years. The 200 year return period was selected for the Project and corresponds to a 24-hour rainfall depth of 153.6 mm.
- Very High dam classification requires consideration of an event that is 2/3 between the 1 in 1000 year event and the Probable Maximum Flood. 24-hour rainfall depths for each event are 187.7 and 284 mm, respectively.

b) Provide the 1-, 6-, and 24-hour duration Significant (1 in 500 year) and Very High (2/3 between 1 in 1000 year and Probable Maximum Precipitation) design precipitation depths for each pond, based on historical data and adjusted for future climate change by the end of expected mine project life (i.e. circa 2050).

Response:

Table 3.2-1 below displays rainfall depths for various durations and return periods, including the 200-year (Significant) and 1000-year (portion of Very High) return periods as well as the Probable Maximum Precipitation (PMP). Rainfall depths are grouped by historical and climate change conditions and not by pond, as the conditions will be the same to all ponds. Methodologies associated with climate change rainfall depths are discussed in response Part C.

The PMP may be impacted by climate change; however, the magnitude of this potential change is not definitive at this time. Historical estimates are adjusted based on the same factors applied to the 1000-year rainfall depths.

Table 3.2-1 Summary of Pond Design Precipitation Depths				
		Design Precipitation Depths (mm) based on Classification		
Condition	**Duration**	**200-year**	**1000-year**	**PMP**
Historical Conditions	1-hour	38.5	47.9	72.5
	6-hours	78.0	95.7	144.8
	24-hours	153.6	187.7	284.0
Climate Change Conditions	1-hour	50.9	64.3	88.9
	6-hours	97.5	121.6	170.8
	24-hours	187.3	232.5	328.8

c) Describe how the current project design accommodates projected increases in short duration extreme precipitation.

Response:

The ponds were designed based on the Canadian Dam Association's (CDA) inflow design flood (IDF) which is selected based on the consequence of failure of the facility. Previously completed hydrology analysis was determined to be applicable for the evaluation of the ponds IDF.

Peak flow and storm volume estimations were tested under a range of baseline conditions in order to produce conservative results for design. It was determined that "summer conditions", which account for large summer storm events, provide the most critical condition in terms of the magnitude of peak flows and maximum total volume, over snowmelt-dominated conditions. The start of the pond life prior to the pit build out and creation of saturated zones was also identified as a critical time when larger flows could be expected. These factors along with including the immediate upstream runoff and total flow conveyed by the collection ditches provided a highly conservative volume as it was assumed that during the IDF, upstream diversions would have negligible capacity.

Calculations were performed in a HEC-HMS model using precipitation depths to generate runoff estimates. The Alternating Block distribution was selected for use in the HEC-HMS model. This distribution was compared with the Huff Distribution and was determined to be more conservative.

Pond volumes were developed assuming a uniform runoff coefficient applied to the total catchment area and associated design rainfall depth. A runoff coefficient of 0.6 was selected from commonly used rational method tables and determined to be conservative given that the average runoff coefficient for the site was previously determined to be 0.4 (EIA Consultant Report #4, CEAR #42).

As identified above, the design of the ponds was based on conservative data producing worst-case scenarios that allow for ample storage capacity. Inflow design flood criteria was based on either the 2/3 1,000 – year and PMF or the 200-year flood event with the minimum storage design criteria set at either the 100-year or 10-year flood event. The pond designs and overall water management plan allows for active management of any future short duration extreme precipitation events.

In addition, infrastructure will be tested under a range of projected climate change conditions. Design peak flows and storm volumes for channels and ponds were tested under climate change conditions by updating peak flow models with climate change rainfall depths, based on the results of the IDF CC Tool developed by the Facility for Intelligent Decision Support of Western University. The projected rainfall depths as well as baseline rainfall depths were downloaded for the Project location from the IDF CC Tool using the CMIP5 Ensemble of Global Circulation Models (GCM). Climate change rainfall depths were bias corrected by calculating the incremental rate of change from baseline conditions to the RCP 4.5 scenario rainfall depths, where the rate is calculated as the projected depth minus the baseline depth. The 200-year and 1000-year rates of change were extrapolated from other return periods for each duration. The rates of change for the PMP were considered to be equal to the 1000-year rates. Rates of change were then applied to the Project rainfall depths, producing a range of storm event depths for return periods up to the PMP and durations up to the 24-hour event.

Resultant climate change rainfall depths were incorporated into the hydrologic model to generate climate change peak flows and storm volumes. Table 3.2-2 presents the channel design flow with and without Climate Change (CC). Pond peak inflows are presented in Table 3.2-3 with and without climate change.

Table 3.2-2 Channel Peak Flows With and Without Climate Change

Channel	Design Return Period	Original Peak Flow Rate	CC Peak Flow Rate	% Peak Flow Increase with CC
	years	[m^3/s]	[m^3/s]	[%]
CC-01	100	1.648	3.802	131%
CC-02	25	0.353	1.003	184%
CC-03a	25	0.192	0.544	183%
CC-03b	10	0.084	0.108	29%
CC-03c	10	0.041	0.052	27%
CC-04	25	0.07	0.198	183%
CC-05	25	0.382	1.054	176%
CC-06	10	0.103	0.133	29%

Table 3.2-2 Channel Peak Flows With and Without Climate Change				
Channel	Design Return Period years	Original Peak Flow Rate [m^3/s]	CC Peak Flow Rate [m^3/s]	% Peak Flow Increase with CC [%]
CC-09	100	0.415	0.957	131%
CC-10	10	0.188	0.241	28%
CC-11	10	0.068	0.087	28%
CC-12	10	0.015	0.019	27%
CC-13	100	2.177	5.031	131%
CC-15	100	2.199	4.985	127%
CC-17	100	0.377	0.85	125%
CC-18	100	0.51	1.162	128%

Table 3.2-3 Pond Inflows With and Without Climate Change					
Pond	IDF	Return Period	Design Peak Flow [m^3/s]	Climate Change Peak Flow [m^3/s]	Climate Change Peak Flow Increase [%]
SESP	Very High	2/3 PMF	32.62	46.92	44%
SWSP	Significant	200	2.18	5.03	131%
WSP	Significant	200	8.9	18.38	106%
RWP	Very High	2/3 PMF	48.9	70.49	44%

Table 3.2-4 presents pond storm volumes associated with each inflow design flood, with and without climate change, and Table 3.2-5 shows the minimum pond storage volumes based on the 100-year and 10-year events, obtained with and without climate change consideration.

Table 3.2-4 Pond Total Storm Volumes for Inflow Design Flood With and Without Climate Change				
Pond	Return Period	Design Volume [1000 m^3]	CC Total Volume [1000 m^3]	CC Volume Increase [%]
SESP	2/3 PMF	397.0	467.6	18%
SWSP	500	86.9	106.9	23%
WSP	500	298.4	367.2	23%
RWP	2/3 PMF	591.3	696.3	18%

Table 3.2-5 Pond Total Storm Volumes for Minimum Storage Events With and Without Climate Change				
Pond	**Return Period**	**Design Volume [1000 m^3]**	**CC Total Volume [1000 m^3]**	**CC Volume Increase [%]**
SESP	100	190.7	237.8	25%
SWSP	100	68.5	85.5	25%
WSP	10	148.7	165.4	11%
RWP	100	259.7	323.9	25%

d) Identify and discuss the potential risks associated with accidental water releases due to projected increases in short duration extreme precipitation. Explain the measures Benga proposes to mitigate adverse effects from accidental release.

Response:

Failure of a water management dam could release large quantities of untreated water and perhaps some of the trapped sediment from one or more of these ponds into the receiving environment. The magnitude of the impact on the environment could range from moderate to high, depending on the quantity of water being stored in each pond, how many dams fail simultaneously, the height of each dam and whether it was a surge pond or a sediment pond that was released. The worst-case scenario would involve a release of large quantities of untreated, selenium contaminated water from the surge ponds into downstream receiving environments, which also flows through private and municipal property, drains into a downstream water source (Oldman Dam Reservoir) for eastern communities and wildlife.

The primary method to prevent catastrophic failure of a water management dam is through engineering design and site selection. The dams will be constructed as per the Canadian Dam Association 2014 Technical Bulletin "Application of Dam Safety Guidelines to Mining Dams". The mitigation measures with respect to the sediment and surge ponds are listed below.

All ponds have been designed as wet ponds with permanent pools. Outflows from the ponds up to the water quality design flood will occur *via* discharge pipes through the embankments, which will have inverts at the levels of the permanent pools. Pond capacities and discharge pipes have been sized to provide the required retention for specified design floods. For dam safety, the sediment ponds will also have emergency overflow spillways to convey the IDF according to each dam's classification. Both the water quality design flood and the inflow design flood were estimated using hydrologic modelling for the largest catchment area reporting to each of the ponds during its operational life.

Three surge ponds will be located downstream of the ex-pit waste dumps to collect toe seepage (RWP, SESP and NWSP). These ponds will be constructed with cross-valley dams and, with the

exception of the NWSP, are located outside of the 100 m riparian buffer. The downstream face of the embankment for the NWSP is located 30 m from Blairmore Creek in order to maximize the water storage capacity in this pond. Water collected in these surge ponds will be pumped directly and/or indirectly to the saturated backfill zones.

For dam safety, the surge ponds will have emergency overflow spillways sized to convey the inflow design flood, which was estimated for the largest catchment area reporting to each of the ponds during its operating life.

Additional mitigation measures beyond engineering design include:

- routine inspection;
- implementation of the Benga's Emergency Response Plan; and
- implementation of Benga's SOPPs.

In the event that water is released from one of these ponds, the primary concern would be the impact to the aquatic environment. These could include:

- WQ including TSS could have harmful effects on aquatic life, including damage to fish gills and interference with feeding and egg incubation;
- increase in volume of water that results in flooding and altering of fish habitat;
- WQ including the release of selenium contaminated water which may result in adverse effects on water quality, fish and fish habitat;
- soils and vegetation could be subject to scour and erosion; impacts would be of short duration and be restricted to the immediate vicinity of the release; and
- wildlife and public safety would be limited to the immediate vicinity of the release.

Such effects could be of moderate to high magnitude, depending on the size, location and duration of the release; however, through the implementation of mitigation measures such as engineering design, site selection, routine inspection and implementation of Emergency Response Plans, such an event is considered a rare probability and moderate magnitude resulting in an overall moderate risk rating. If water released as a result of dam failure entered Blairmore Creek or Gold Creek, the contaminated water would be flushed downstream and diluted to background levels quickly. The effects would be localized in nature and be of short duration. Furthermore, in the event of a dam failure, Benga would implement its Emergency Response Plans immediately. Therefore, impacts to wildlife, human health and public safety have a low probability and low magnitude resulting in an overall risk rating of low.

e) Explain whether Benga proposes measures besides altering project design to prevent the occurrence of accidental water release from projected increases in short duration extreme precipitation.

Response:

As stated above, through the implementation of mitigation measures such as engineering design, site selection, routine inspections, implementation of Benga SOPP's and implementation of Emergency Response Plans, the occurrence of an accidental water release is considered a low probability and moderate magnitude, based on Benga's Criteria for Risk Matrix, resulting in an overall moderate risk rating. The conservative nature of the design and the overall water management plan allows for the site to actively manage any potential future increases in short duration extreme precipitation events.

LAND USE AND LAND MANAGEMENT

3.3 Information Request 3.3

Alberta Environment and Parks. 2018. Livingstone-Porcupine Hills Land Footprint Management Plan. Government of Alberta.[2]

The Livingstone – Porcupine Hills Land Footprint Management Plan (LFMP) was announced by Alberta Environment and Parks (AEP) and came into effect in May 2018. The plan states that "The Livingstone-Porcupine Hills LFMP is a subregional plan, which provides direction for the long-term cumulative effects of the human footprint on public lands. It focuses on impacts on biodiversity and watersheds in the Livingstone and Porcupine Hills public land use zones."

An objective of the Livingstone – Porcupine Hills LFMP is to manage motorized access to sustain biodiversity and watershed integrity. The EIA was updated prior to the issuance of the Livingstone – Porcupine Hills LFMP and Benga has not yet provided any information on discussions it has had with Alberta Environment and Parks with respect to ensuring the Project will comply with the objectives of the Livingstone – Porcupine Hills LFMP.

The Panel requires information on new motorized access on Crown land to understand if the Project might affect the Livingstone – Porcupine Hills LFMP objectives as well as any restrictions that may be imposed on the Project as a result.

2 The Livingstone – Porcupine Hills Land Footprint Management Plan is publically available from: https://open.alberta.ca/publications/9781460139660

a) Describe any discussions between Benga and Alberta Environment and Parks concerning the LFMP.

Response:

Benga have not been involved in any discussions to date with Alberta Environment and Parks concerning the development of the Livingstone -Porcupine Hills Land Footprint Management Plan (LFMP).

b) Provide a description, and maps as appropriate, of the Project's contribution to any new motorized access on Crown land.

Response:

The primary access route to the Project is the existing access road located immediately north of Blairmore, off provincial Highway 3. The Project will not be creating any new permanent motorized access on Crown land.

c) Discuss any implications of application of LFMP objectives to the Project.

Response:

The Livingstone-Porcupine Hills LFMP, issued May 2018, outlines a system to minimize the extent, duration, and rate of cumulative footprint to achieve landscapes with healthy, functioning ecosystems that provide a range of benefits to communities and all Albertans. The purpose of the LFMP is accomplished by addressing two core components of the land footprint:

- motorized access; and
- spatial human footprint.

There are two management outcomes listed in the plan that relate to this Project:

- Outcome 1: Human footprint and disturbance are effectively minimized so as to sustain biodiversity and watershed values and provide a range of benefits to communities and all Albertans; and
- Outcome 2: Operational planning and management are aligned so as to minimize the extent, duration and rate of footprint development.

The Project is aligned with the objectives of the LFMP in the following manner:

- the Project provides a range of socio-economic benefits to communities and Albertans;
- the Project will undertake progressive reclamation overall Project disturbed areas, to minimize the extent and duration of the footprint;
- the Project has a robust Conservation & Reclamation plan that incorporates monitoring and adaptive management strategies, on topics including biodiversity and watersheds;
- there will be no new permanent motorized access created because of the Project;

- only a portion of the Project Mine Pit Boundary (MPB) is within the Livingstone Public Land Use Zone (2038 ha or 55% of the total MPB area). Of that, only 634 ha of land will be disturbed within this Public Land Use Zone (approximately 43% of the total disturbed Project area); and
- 185 ha of legacy mine footprint will be reclaimed, 62 ha of which is located on Crown Land within the Livingstone Public Land Use Zone.

d) Describe any proposed mitigation measures related to motorized access on Crown lands.

Response:

The Project will not be creating any new permanent motorized access on Crown lands.

3.4 Information Request 3.4

Seventh Addendum to the Environmental Impact Assessment. Appendix A-1: Environmental Field Reports. (CEAR #72).

Historically, Public Lands applications can be filed, and have been accepted without stakeholder consents in place. Consents include letters of notification as well as any response that was received, and written permission from overlapping disposition holders, private land owners and notation holders. A Land Standing Activity Report (LSAS) and the Landscape Analysis Tool (LAT) identify any registered stakeholders within the project area down to the quarter section. The reports identify any users, restrictions, limitations, or unallowable uses of the lands as well as providing contact information.

A decision on a Public Lands application cannot be made until all consents are received. The consents in EIS Addendum 7 (CEAR #72) are not complete. Evidence that the other users or stakeholders were notified is required to support the application. The Reservation Summary Table does not provide sufficient information that stakeholders have been notified, consulted with or that an appropriate course of action has been resolved.

a) Provide a complete package of notifications and consents. This should include at minimum, notification letters, responses, consents, and permissions on identified lands within LSAS or LAT reports.

Response:

Table 3.4-1 (formerly Table 3-1 from the Public Lands Application [Appendix #3, CEAR #54]) has been updated to include the consent and notification status for the land reservations within the proposed disposition boundaries. Table 3.4-2 (formerly Table 3-1 from the Public Lands Application [Appendix #3, CEAR #54]) provides a summary of surface dispositions and associated conflicts within the surface dispositions that will be required for the Project. Consent letters that have already been obtained for the Project, and submitted as part of the Public Lands Application, are provided in Appendix 3.4-1. Letters and evidence of notification that have been sent out to various disposition holders for the Project are provided in Appendix 3.4-2.

Regarding Protective Notation 900426, the initial Historical Resource Application (HRA) to obtain clearance under the *Historical Resources Act* was submitted to Alberta Culture and Tourism on March 13, 2015 (HRA #4560-14-0001-002). Alberta Culture and Tourism issued a *Historical Resources Act* Requirements (Schedule A) (HRA #4560-14-0001-002, OPaC #6406798) on May 8, 2015, which required that a Historical Resource Impact Assessment (HRIA) be conducted. The HRIA was conducted under Archaeological Permit 15-074 to record archaeological or historic area resources, including those associated with past mining activities such as the Greenhill Mine. The HRIA final report was submitted to Alberta Culture and Tourism on March 4, 2016. Alberta Culture and Tourism issued a *Historical Resources Act* Requirements (HRA #4560-14-0001-003) conditional approval on December 20, 2017 with the following conditions:

- The site requires avoidance or additional studies. If avoidance is not feasible, then areas of potential impact from development must be shovel tested. The use of temporary fencing is required to ensure avoidance of archaeological deposits during construction.
- Detailed, finalized plans are required for the proposed work in the vicinity of the Greenhill Mine site. These plans must include detailed information about load-out design (showing grades), cut-and-fill areas and alignment specifics.

Table 3.4-1 Reservations Within the Proposed Disposition Boundaries

Reservation / Activity Number	Conflict	Mitigation/ Action Required	Disposition Holder	LSAS Requirement(s)	Status of Notification/ Consent
Mineral Surface Lease (Mining Area)					
CNT 090027	FireSmart Community Zone	Benga has prepared a fire control plan in accordance with the FireSmart Wildfire Assessment System (see Section C.7.6 of the EIA).	Forestry and Emergency Response Division of Environment and Sustainable Resource Development (ESRD) – Calgary Office	0510: Buffer 1: No Restrictions 710: See Comments All applications must be referred via email to the "Wildfire Prevention Officer" at the Calgary Forestry Office: esrd.eds-clgr-firesmart@gov.ab.ca	Letter drafted and emailed on July 11, 2019 and is provided in Appendix 3.4-2. Consent required prior to application. Submit email to FireSmart inbox outlining plan. Consent is implied after 15 days.
CNT 860041	Potential Timber Disposal – to determine volumes and establish AU A.A.CC. within the McCrillivary Creek Misc. timber use area of the CS M.U.	There are no restrictions with use of this area. Main mitigation is to reclaim the area to equivalent capability as described in Section F of the EIA.	Lands Division of ESRD – Blairmore Office – Land Use Area	0222: Potential Timber Disposal 1: No Restriction 710: See Comments To determine volumes and establish AU A.A.CC. within the McCrillivary Creek Misc. Timber Use Area of the CS M.U.	Letter drafted and emailed on July 11, 2019 and is provided in Appendix 3.4-2.
CNT 980012	Snowmobile Trails – managed/maintained by Crowsnest Economic Development Board	Mitigation measures to be determine in consultation with local trail users such as the Crow Snow Riders Snowmobile Club.	Lands Division of ESRD – Blairmore Office – Land Use Area	0363: Snowmobile Trails 1: No Restriction 710: See Comments These trails managed/ maintained by Crowsnest Economic Development Board. Includes all theoretical road allowance. Refer all dispositions to L&FS Blairmore. Sketch on file.	Letter drafted and emailed on July 11, 2019 and is provided in Appendix 3.4-2.

Table 3.4-1 Reservations Within the Proposed Disposition Boundaries

Reservation / Activity Number	Conflict	Mitigation/ Action Required	Disposition Holder	LSAS Requirement(s)	Status of Notification/ Consent
PNT 090084	Multiple Resource Concerns - This location may fall within an area of foothills fescue grassland, a very valuable native grassland type that is limited in remaining area.	Mitigation measures as described in Section 4.3.4 of CR #8 and Section E.8.5.1 of the EIA.	Lands Division of ESRD – Pincher Creek Office – Rangeland District	0181: Multiple Resource Concerns 5: No Surface Sale Dispositions 710: See Comments Proponents must consult Information Letter (IL) 2010-02, Fescue Grasslands – Principles for Minimizing Surface Disturbance and make early contact with Alberta Environment & Sustainable Resource Development staff for the area in question.	Letter drafted and emailed on July 11, 2019 and is provided in Appendix 3.4-2.
PNT 090087	Multiple Resource Concerns - This location may fall within an area of foothills fescue grassland, a very valuable native grassland type that is limited in remaining area.	Mitigation measures as described in Section 4.3.4 of CR #8 and Section E.8.5.1 of the EIA.	Lands Division of ESRD – Pincher Creek Office – Rangeland District	0181: Multiple Resource Concerns 5: No Surface Sale Dispositions 710: See Comments Proponents must consult (Draft 2009) Information Letter, Fescue Grasslands – Principles for Minimizing Surface Disturbance and make early contact with Alberta Sustainable Resource Development staff for the area in question. The IL addresses obligations and specific direction regarding all potential surface disturbance related activity in foothills rough fescue grassland plant communities.	Letter drafted and emailed on July 11, 2019 and is provided in Appendix 3.4-2.

Table 3.4-1 Reservations Within the Proposed Disposition Boundaries

Reservation / Activity Number	Conflict	Mitigation/ Action Required	Disposition Holder	LSAS Requirement(s)	Status of Notification/ Consent
PNT 880617	Steep rolling topography. No agricultural dispositions are permitted with the exception of unimproved grazing.	In order to mitigate the concern associated with potential instability, Benga has developed mine design criteria based on the results of the geotechnical investigation and geological modelling (Section B.8.6 of the EIA). A Conservation and Reclamation Plan has been developed for the Project (Section F of the EIA), which outlines measures that will be utilized to return the land to equivalent capability. For more information, please contact Tyler Riewe, Senior Manager Safety, Health and Environment by email at tyler.riewe@rivresources.com or by telephone at 403.753.8040.	Lands Division of ESRD – Pincher Creek Office – Rangeland District	0142: Steep Rolling Topography 3: No Agricultural Disposition 110: Unimproved Grazing	Letter drafted and emailed on July 11, 2019 and is provided in Appendix 3.4-2.
PNT 880618	Steep rolling topography. No agricultural dispositions are permitted.	In order to mitigate the concern associated with potential instability, Benga has developed mine design criteria based on the results of the geotechnical investigation and geological modelling (Section B.8.6 of the EIA). For more information, please contact Tyler Riewe, Senior Manager Safety, Health and Environment by email at tyler.riewe@rivresources.com or by telephone at 403.753.8040.	Lands Division of ESRD – Pincher Creek Office – Rangeland District	0142: Steep Rolling Topography 3: No Agricultural Disposition	Letter drafted and emailed on July 11, 2019 and is provided in Appendix 3.4-2.

Table 3.4-1 Reservations Within the Proposed Disposition Boundaries

Reservation / Activity Number	Conflict	Mitigation/ Action Required	Disposition Holder	LSAS Requirement(s)	Status of Notification/ Consent
PNT 880619	Steep rolling topography. No agricultural dispositions are permitted with the exception of unimproved grazing.	A Conservation and Reclamation Plan has been developed for the Project (Section F of the EIA), which outlines measures that will be utilized to return the land to equivalent capability. For more information, please contact Tyler Riewe, Senior Manager Safety, Health and Environment by email at tyler.riewe@rivresources.com or by telephone at 403.753.8040.	Lands Division of ESRD – Pincher Creek Office – Rangeland District	0142: Steep Rolling Topography 3: No Agricultural Disposition 110: Unimproved Grazing	Letter drafted and emailed on July 11, 2019 and is provided in Appendix 3.4-2.
PNT 930299	Grazing allotment area, no agricultural dispositions, grazing permits only. Gap Range Allotment.	Consultation has been undertaken with the grazing lease holders in the area (Section G of the EIA). A Conservation and Reclamation Plan has been developed for the Project (Section F of the EIA), which outlines measures that will be utilized to return the land to equivalent capability.	Department of Sustainable Resource Development – Rocky Mountain Forest Reserve South Office – Rangeland District	0165: Grazing Allotment Area 3: No Agricultural Disposition 130: Grazing Permit Only 710: See Comments All surface disturbance applications or amendments must be referred to the holding agency for Rangeland Agrologist review prior to approval. Requirements under Section 21 of the Forest Reserves Regulation must be met prior to the approval. Please email referral package to: RMFR_South@gov.ab.ca for review and approval.	Letter drafted and emailed on July 11, 2019 and is provided in Appendix 3.4-2. Consent of Occupant letter in accordance with AER Bulletin 2015-02 is included in Appendix 3.4-1.

Table 3.4-1 Reservations Within the Proposed Disposition Boundaries

Reservation / Activity Number	Conflict	Mitigation/ Action Required	Disposition Holder	LSAS Requirement(s)	Status of Notification/ Consent
PNT 940130	Grazing allotment area, no agricultural dispositions, grazing permits only. Blairmore Gold Range Allotment.	Consultation has been undertaken with the grazing lease holders in the area (Section G of the EIA). A Conservation and Reclamation Plan has been developed for the Project (Section F of the EIA), which outlines measures that will be utilized to return the land to equivalent capability.	Department of Sustainable Resource Development – Rocky Mountain Forest Reserve South Office – Rangeland District	0165: Grazing Allotment Area 3: No Agricultural Disposition 130: Grazing Permit Only 710: See Comments All surface disturbance applications or amendments must be referred to the holding agency for Rangeland Agrologist review prior to approval. Requirements under Section 21 of the Forest Reserves Regulation must be met prior to the approval. Please email referral package to: RMFR_South@gov.ab.ca for review and approval.	Letter drafted and emailed on July 11, 2019 and is provided in Appendix 3.4-2. Consent of Occupant letter in accordance with AER Bulletin 2015-02 is included in Appendix 3.4-1.

Table 3.4-1 Reservations Within the Proposed Disposition Boundaries

Reservation / Activity Number	Conflict	Mitigation/ Action Required	Disposition Holder	LSAS Requirement(s)	Status of Notification/ Consent
PNT 960092	Steep rolling topography. No agricultural dispositions are permitted with the exception of "Grazing Haying" - These lands best suited for grazing due to steep slopes ranging from 15% to >30%. Prime watershed protection along gold creek and fish habitat; potentially valuable for ungulate habitat and potential for reforestation under a multiple use plan.	In order to mitigate the concern associated with potential instability, Benga has developed mine design criteria based on the results of the geotechnical investigation and geological modelling (Section B.8.6 of the EIA). A Conservation and Reclamation Plan has been developed for the Project (Section F of the EIA), which outlines measures that will be utilized to return the land to equivalent capability. For more information, please contact Tyler Riewe, Senior Manager Safety, Health and Environment by email at tyler.riewe@rivresources.com or by telephone at 403.753.8040.	Department of Sustainable Resource Development – Pincher Creek Office – Rangeland District	0142: Steep Rolling Topography 3: No Agricultural Disposition 100: Grazing Haying 710: See Comments	Letter drafted and emailed on July 11, 2019 and is provided in Appendix 3.4-2.

Table 3.4-1 Reservations Within the Proposed Disposition Boundaries

Reservation / Activity Number	Conflict	Mitigation/ Action Required	Disposition Holder	LSAS Requirement(s)	Status of Notification/ Consent
Mineral Surface Lease (Access Corridor)					
PNT 900430*	Waste Disposal/Reclamation Site	Construction and Reclamation processes as discussed in Section 6.4 and 6.5 in order to return the land to equivalent capability. Utilization of waste storage (see Section 6.3) and spill response procedures (see Section C.7.6 of the EIA) that will reduce potential for contamination to enter the adjacent drainage.	Department of Environment and Water	The LSAS report does not identify any restrictions associated with this PNT.	Letter drafted and emailed on July 11, 2019 and is provided in Appendix 3.4-2.
Licence of Occupation (Western Rail Loop)					
CNT 090027	FireSmart Community Zone	Benga has prepared a Development of a fire control plan in accordance with the FireSmart Wildfire Assessment System (Section C.7.6).	Forestry and Emergency Response Division of Environment and Sustainable Resource Development – Calgary Office	0510: Buffer 1: No Restrictions 710: See Comments All applications must be referred via email to the "Wildfire Prevention Officer" at the Calgary Forestry Office: esrd.eds-clgr-firesmart@gov.ab.ca	Letter drafted and emailed on July 11, 2019 and is provided in Appendix 3.4-2. Consent required prior to application. Submit email to FireSmart inbox outlining plan. Consent is implied after 15 days.
PNT 090084	Multiple Resource Concerns - This location may fall within an area of foothills fescue grassland, a very valuable native grassland type that is limited in remaining area.	Mitigation measures as described in Section 4.3.4 of CR #8 and Section E.8.5.1 of the EIA.	Lands Division of Department of Sustainable Resource Development – Pincher Creek Office – Rangeland District	0181: Multiple Resource Concerns 5: No Surface Sale Dispositions 710: See Comments Proponents must consult Information Letter (IL) 2010-02, Fescue Grasslands – Principles for Minimizing Surface Disturbance and make early contact with Alberta Environment & Sustainable Resource Development staff for the area in question.	Letter drafted and emailed on July 11, 2019 and is provided in Appendix 3.4-2.

Table 3.4-1 Reservations Within the Proposed Disposition Boundaries

Reservation / Activity Number	Conflict	Mitigation/ Action Required	Disposition Holder	LSAS Requirement(s)	Status of Notification/ Consent
Licence of Occupation (Eastern Rail Loop & Access)					
CNT 090027	FireSmart Community Zone	Benga has prepared a Development of a fire control plan in accordance with the FireSmart Wildfire Assessment System (Section C.7.6).	Forestry and Emergency Response Division of Environment and Sustainable Resource Development – Calgary Office	0510: Buffer 1: No Restrictions 710: See Comments All applications must be referred via email to the "Wildfire Prevention Officer" at the Calgary Forestry Office: esrd.eds-clgr-firesmart@gov.ab.ca	Letter drafted and emailed on July 11, 2019 and is provided in Appendix 3.4-2. Consent required prior to application. Submit email to FireSmart inbox outlining plan. Consent is implied after 15 days.
PNT 090084	Multiple Resource Concerns - This location may fall within an area of foothills fescue grassland, a very valuable native grassland type that is limited in remaining area.	Mitigation measures as described in Section 4.3.4 of CR #8 and Section E.8.5.1 of the EIA.	Lands Division of Department of Sustainable Resource Development – Pincher Creek Office – Rangeland District	0181: Multiple Resource Concerns 5: No Surface Sale Dispositions 710: See Comments Proponents must consult Information Letter (IL) 2010-02, Fescue Grasslands – Principles for Minimizing Surface Disturbance and make early contact with Alberta Environment & Sustainable Resource Development staff for the area in question.	Letter drafted and emailed on July 11, 2019 and is provided in Appendix 3.4-2.
PNT900426*	Registered Historic Resource – Greenhill Mine Complex	A Historical Resource Impact Assessment has been conducted (see Section E.13 of the EIA and Section 5.8 of CR #10).	Not listed in LSAS report.	N/A	Refer to JRP IR-3.4 for details regarding PNT 900426. An application to obtain clearance under the *Historical Resources Act* was submitted to Alberta Culture and Tourism and a conditional approval was issued.

Note:

* Not included in LSAS Report but shown on AEP's Disposition Spatial Processing Tool.

Table 3.4-2 Dispositions Within the Boundaries of the Dispositions Proposed by Benga

Disposition	Disposition Holder	Purpose	Location within Proposed Disposition Boundary	Status of Consent
Mineral Surface Lease (Mining Area)				
CTPC 050124	Egbert Veldman	Coniferous Timber Permit	NW-01-009-04 W5M; L09, L16-02-009-04 W5M; L01-11-009-04 W5M; L04-12-009-04 W5M	Consent letter in accordance with AER Bulletin 2015-02 is included in Appendix 3.4-1.
DLO140170	1653488 Alberta Inc.	Water Intake	NE 13-008-04 W5M	Not required at this time, as disposition is under application has not been approved. Area currently excluded from the boundary of the proposed disposition.
EZE830147	Altalink Management Ltd.	Powerline	L13-13-008-04 W5M; L15, L16-14-008-04 W5M	Area currently excluded from the boundary of the proposed disposition until overlap can be resolved. A consent letter in accordance with AER Bulletin 2015-02 is included in Appendix 3.4-1.
GRL 36801	Don Driver	Grazing Lease	NE-31-008-03 W5M	Consent letter in accordance with AER Bulletin 2015-02 is included in Appendix 3.4-1.
GRL960066	Don Driver	Grazing Lease	NW-31-008-03 W5M	Disposition listed as expiring in 2016/06/14. Consent letter in accordance with AER Bulletin 2015-02 is included in Appendix 3.4-1.
GRP870052	Gold Creek Grazing Co-Op Ltd.	Grazing Permit	L08, L09, L16-14-008-04 W5M; L01, L08, L09, L15, L16-26-008-04 W5M	Consent letter in accordance with AER Bulletin 2015-02 is included in Appendix 3.4-1.
LOC141938	Benga Mining Ltd.	Access Road	L10, L15-25-008-04 W5M; L02, L10-36-008-04 W5M	None Required – Benga disposition.

Table 3.4-2 Dispositions Within the Boundaries of the Dispositions Proposed by Benga

MLL 1948	Devon Canada Corporation	Other Industrial	LSD 02, 07, 10, 15-14-008-04 W5M	Area currently excluded from the boundary of the proposed disposition until overlap can be resolved. Consent letter in accordance with AER Bulletin 2015-02 is included in Appendix 3.4-1.
MSL043285	Devon Canada Corporation	Wellsite	L01, LS02-11-009-04 W5M	
MSL801502	Devon Canada Corporation	Wellsite And Access Road	L13-01-009-04 W5M; L16-02-009-04 W5M; L01, L02-11-009-04 W5M; L04-12-009-04 W5M	
PLA052764	Devon Canada Corporation	Pipeline	L02-11-009-04 W5M	Consent letter in accordance with AER Bulletin 2015-02 is included in Appendix 3.4-1.
PLA800692	Lonlife Resources Ltd.; Norco Resources Limited; Canadian Natural Resources Limited; Opinac Exploration Limited	Pipeline	L13-01-009-04 W5M; L16-02-009-04 W5M; L01, L02-11-009-04 W5M; L04-12-009-04 W5M	Devon has confirmed that they are the holder of this PLA (it was purchased from CNRL). Consent letter in accordance with AER Bulletin 2015-02 is included in Appendix 3.4-1.
ROE156**	Devon Canada Corporation	Coal Mining	L10-25-008-04 W5M	Area currently excluded from the boundary of the proposed disposition until overlap can be resolved. Dispositions administered by Surface Rights Board, who will not transfer disposition to Benga until the Project receives EPEA and CCA approval.
ROE324**	Devon Canada Corporation	Coal Mining	N½LS05, S½L12-06-009-03 W5M	
ROE1169**	Devon Canada Corporation	Coal Mining	L04, L05-06-009-03 W5M; LS01, L08-01-009-04 W5M	
ROE8751**	Devon Canada Corporation	Coal Mining	L15-25-008-04 W5M; L02, L07, L10-36-008-04 W5M	
TFA 154961	Benga Mining Ltd.	AER Access Temporary – Industrial	NW 31-008-03 W5M; NW 06-009-03 W5M; SE 01-009-04 W5M	None Required – Benga disposition.
TFA 155858	Benga Mining Ltd.	AER Access Temporary – Industrial	N 13-008-04 W5M; W 13-008-04 W5M; SE 14-008-04 W5M	None Required – Benga disposition.

Table 3.4-2 Dispositions Within the Boundaries of the Dispositions Proposed by Benga				
TFA 162596	Benga Mining Ltd.	AER Access Temporary – Industrial		None Required – Benga disposition.
TFA 162911	Benga Mining Ltd.	AER Access Temporary – Industrial	N-13-008-04 W5M	None Required – Benga disposition.
TPA 1677	Terry D. Michalsky	Trapping Agreement	L14, NE, SE 35-008-04 W5M L03, L06, L11, L14, NE, SE-02-009-04-W5M; L03-11-009-04-W5M; SE, SW, NW, L16, L09, L10, 01-009-04-W5M; SW, L02, L07, L12, L13-06-009-03 W5M; pt.LS3, pt. L04-12-9009-04 W5M	Benga has notified the holder of the trapline. No formal consent required under the *Public Lands Act*. A copy of the meeting notes from May 17, 2016 is included in Appendix 3.4-2. The only concern was related to access.
TPA 2426	Jerry D. Newman	Trapping Agreement	pt.L01, pt.L2-11-09-04 W5M; pt.L03, pt.L04-12-09-04 W5M	Benga has notified the holder of the trapline. No formal consent required under the *Public Lands Act*. A copy of StakeTracker record of communication from May 10, 2016 and June 2, 2016 are included in Appendix 3.4-2.
Mineral Surface Lease (Access Corridor)				
No surface dispositions are present within the proposed MLL area.				
Licence of Occupation (Western Rail Loop)				
REC910007*	Crowsnest Pass Golf & Country Club	Non-Commercial Recreational Development	pt. LS09-03-008-04 W5M	Benga has consulted with the Crowsnest Pass Golf and Country Club, there are no outstanding issues related to this REC. The Crowsnest Pass Golf and Country Club have submitted a letter of support (CEAAR #183) for the Project, which is included in Appendix 3.4-1. A legal agreement regarding facilities and leases between Benga and the Crowsnest Pass Golf and Country Club is in place. Documents regarding this agreement are private and have not been included in this response. For further information, please contact Grant Lindstrom at Grant.Lindstrom@rivresources.com.

Table 3.4-2 Dispositions Within the Boundaries of the Dispositions Proposed by Benga				
DRS850045	Blairmore Office, Lands Division Department of Sustainable Resource Development	Blairmore Ranger Station; disposition listed as expiring in 2015/08/07	pt. LS10-03-008-04 W5M	Area currently excluded from the boundary of the proposed disposition until overlap can be resolved. Benga has consulted with the local lands office and it was agreed that the access to the helicopter pad within the DRS would be rerouted as shown in CR #10, Figure 5.1-2.
Licence of Occupation (Eastern Rail Loop & Access)				
PLA000472	Atco Gas And Pipelines Ltd. (South)	Pipeline	pt. LS03, pt. LS06-02-008-04 W5M	Area currently excluded from the boundary of the proposed disposition until overlap can be resolved. Consent letter in accordance with AER Bulletin 2015-02 is included in Appendix 3.4-1.

Notes:
* Not included in LSAS Report but shown on AEP's Disposition Spatial Processing Tool.
** Administered by the Surface Rights Board

3.5 Information Request 3.5

Third Addendum to the Environmental Impact Assessment – Public Lands Application – Revision 2. (CEAR #54).

Comments from Vern Emard. (CEAR #136)

The Panel received a comment from Mr. Vern Emard (CEAR #136), a private landowner, in the vicinity to the project who is concerned that the access agreements that are currently in place could be impacted. The comment requested confirmation that both access and power will not be affected.

In order to assess the potential effects from the Project, the Panel requires additional information on the current and future status of access roads and other infrastructure in the Land Use Regional Study Area.

a) Provide a map illustrating all existing and future access roads in the Land Use Regional Study Area that may be affected by the Project.

Response:

Please refer to Figure 3.5-1, which illustrates the existing roads, trails, and cutlines within the Project's Land Use Regional Study Area. The Project's primary access route is the existing access road off Highway 3, immediately north of the Town of Blairmore.

Benga is aware that third parties have been using its private road and private property to access areas to the East of Gold Creek. Through stakeholder engagement, ongoing through the development of the Project, Benga have informed all potentially affected landowners that the private road would be closed to general public use based on Health, Safety and Environment (HSE) concerns associated with an active mining operation. At this time, areas on the East side of Gold Creek will be accessible from Highway 40 through trails that run to the North of the Project Area or alternatively from trails that run along Gold Creek from the South starting near the Town of Frank.

b) Discuss how Benga plans to mitigate any potential adverse effects on access and power supply for private landowners near the Project.

Response:

As part of the Project's Access Management Plan, supervised access through the site could be provided to applicable, adjacent landowners if there are no active construction or mining operations in the area (JRP IR-4.5, Appendix 4.5-1). There will be extended periods when this access will not be possible and landowners will need to utilize alternate trails.

There is no planned disruption to the existing power source the applicable, adjacent landowners, due the Project.

3.6 Information Request 3.6

Grassy Mountain Coal Project - Updated Environmental Impact Assessment. Section E – Environmental Assessment. (CEAR #42).

Fifth Addendum to the Environmental Impact Assessment. (CEAR #69).

In Section E.11.7 of the updated EIA (CEAR #42), Benga states that the "Project will also contribute an estimated $140 million (NPV 2015) and $210 million (NPV 2015) to provincial and federal corporate income taxes respectively as well as approximately $195 million (NPV 2015) in provincial royalties over the 23-year operating life of the project, assuming a $140/tonne average real price of coal."

In response to AER's Supplemental Information Request (SIR) 68 b), Benga states that it "has provided alternative royalty forecasts using $100 USD/tonne and $200 USD/tonne respectively and applying the same financial methodology used in the application" (CEAR #69).

a) Provide estimates of provincial and federal income taxes based upon $100 USD/tonne and $200 USD/tonne price scenarios.

Response:

Estimates of provincial and federal income tax for metallurgical coal prices of $100 USD/tonne and $200 USD/tonne are provided in Table 3.6-1.

Table 3.6-1 Estimates of Provincial and Federal Income Tax for Metallurgical Coal Prices of $100 USD/Tonne and $200 USD/Tonne

Met Coal Price (USD/t)	Income Tax - Cumulative ($ Million)	Income Tax - NPV8 ($ Million)
100	450	105
200	2,400	750

b) Discuss the effects for $100 USD/tonne and $200 USD/tonne realized coal price scenarios on local benefits such as employment and capital expenditures.

Response:

Benga does not expect the price of coal to alter the initial capital cost or the procurement and hiring patterns of the project. The local benefits will remain unchanged.

3.7 Information Request 3.7

Grassy Mountain Coal Project - Updated Environmental Impact Assessment. Section E – Environmental Assessment. (CEAR #42).

Comments from Victor and Barbara Koch. (CEAR #129).

Comments from Allan Garbutt. (CEAR #158).

In Section E.11.3 of the updated EIA (CEAR #42), Benga predicted that additional demand for municipal infrastructure, driven by the population increase estimated under the Application Case, is predicted to exceed the current and planned levels of municipal infrastructure in Crowsnest Pass but not in Sparwood.

Benga states that: "Over its operational life, the Project will employ, on average, 385 people per year. The population of Ranchland is expected [to] rise by 19% above the Base Case as a result of the Project. The effect on Crowsnest Pass will be 22% above the Base Case and in Sparwood it will be 19%."

Benga further specifies that the "Annual municipal tax payments to Ranchland and Crowsnest Pass are estimated at $990,000 and $490,000, respectively. Using an 8% discount rate, the present value of the municipal taxes over the life of the project is calculated to be $11.2 million ($2015)."

The above statements appear to show that the distribution of municipal taxes paid to Ranchland compared to those paid to Crowsnest Pass favours Ranchland, but that effects will be greater on Crowsnest Pass in terms of population growth.

The Panel has also received comments from participants concerned with the adequacy of financial support that may be provided by Benga to meet infrastructure requirements in the Municipality of Crowsnest Pass should the project be approved, such as for upgrading Highway 3 (CEAR #129), and ensuring the adequacy of municipal services such as health, water and power services (CEAR #158).

a) Discuss whether the Municipality of Crowsnest Pass will have capacity in current infrastructure and services (e.g. health, power, sewer, water) to respond to potential pressures resulting from the effects of increased population and housing demand.

Response:

Benga has extensively discussed the Project with the Municipality of Crowsnest Pass and based on those discussions Benga understands that the Project's impact on the municipality's tax base will place the Municipality in a better position to respond to the infrastructure and services needs of its population. Benga notes that the Crowsnest Pass Municipal Council has expressed its support for the project in the recent letter they sent to the JRP (CEAR #123). Specifically:

> "*The Council of the Municipality of Crowsnest Pass supports the Riversdale project. In fact, we need this coal mine to add essential tax relief for the residents of Crowsnest Pass. We believe Riversdale to be a community partner and an*

integral player to making this community as prosperous as it has been in the past."

b) Discuss measures Benga proposes to mitigate project-related effects to Crowsnest Pass municipal infrastructure and services.

Response:

Benga has been and will continue to be a supporter in the community providing charitable donations and contribution of volunteers for value-adding community projects. Quoting from the recent letter to the JRP from the Crowsnest Pass Municipal Council (CEAR #123):

> *"Riversdale Resources/Benga Mining Ltd. has already shown a tremendous support for our community. They are huge advocates of community sustainability. Their staff members sit on many local boards, the company funds major initiatives in the community and they support not-for-profit groups and school programs. They are spending their money in the community they hope to employ."*

Along with Benga's community investments, Section 8.4 of the SEIA outlines Benga's mitigations with respect to municipal infrastructure. Benga is committed to working with the municipalities in the region to keep them informed of its development plans and their timing so that the affected municipalities have sufficient time to plan for changes in the demand for services. The use of an on-site camp and workforce transportation strategy will serve to limit the demands placed on local municipal infrastructure by the mobile construction workforce.

Additionally, we note that, per section 8.3.2, the Project will not tie in directly to municipal water or sewer lines in the region. Water will be recovered from local runoff or wells and wastewater will be treated onsite before being returned to the landscape. The Project will also make use of the regional waste transfer station operated by Crowsnest Pass.

c) Indicate whether Benga plans to provide financial or other support to upgrade Highway 3 as a result of the Project's mine access and load out site.

Response:

Benga is currently in discussions with Alberta Transportation regarding necessary upgrades to intersections as a result of the Project. Benga anticipates providing some financial support for these upgrades.

3.8 Information Request 3.8

Grassy Mountain Coal Project - Updated Environmental Impact Assessment. Section E – Environmental Assessment. (CEAR #42).

Comments from Allan Garbutt. (CEAR #158).

According to the EIS Guidelines and the Panel's Terms of Reference, the environmental

assessment must consider alternative means of carrying out the Project that are technically and economically feasible, and the environmental effects of any such alternatives.

In the Updated EIA, Benga compared trucking vs covered conveyors as potential transportation means (CEAR #42). As noted by members of the public, autonomous vehicle technology is already in place at other mining projects in Alberta (CEAR #158). The updated EIA does not mention using autonomous vehicles and other types of autonomous mining equipment as an alternative.

Given the growing use of this technology, the Panel requires additional information on whether autonomous vehicles may be a feasible option for the Project and the extent to which Benga has considered this. The use of autonomous vehicles and equipment may result in potential environmental, social and economic effects that would differ from what Benga has presented in the EIA, such as the workforce numbers provided in Section E.11.3.2 (CEAR #42). In addition, adoption of autonomous diesel vehicles as opposed to autonomous electric vehicles may have differing environmental, social, and economic effects.

a) Clarify if Benga and/or related companies uses, or proposes to use, autonomous vehicles and/or equipment in any of their existing or planned mining operations.

Response:

Benga do not currently use autonomous vehicles on other projects and Benga has not proposed to use autonomous vehicles in its Project application for Grassy Mountain.

b) Discuss whether Benga has considered the use of autonomous vehicles for the Project and whether this technology, is or may become, technically or economically feasible in the life of the mine.

Response:

Benga is aware of autonomous vehicles technology use within the mining sector; however, for the Project Benga have decided to not implement this technology until it is demonstrated to be proven technology in similar (mountainous) conditions. Benga recognizes that this technology may be technically and economically feasible during the operating life of the mine; however, again its application will depend on an evaluation of the benefits, costs and risks as the technology develops and is proven in application.

c) Discuss any limitations or restrictions related to the use of autonomous vehicle technology at mountain mines such as the proposed Project. Specify any differences

between use of autonomous diesel vehicles and autonomous electric vehicles (i.e. emissions, hauling limitations, benefits to productivity, energy consumption, etc.).

Response:

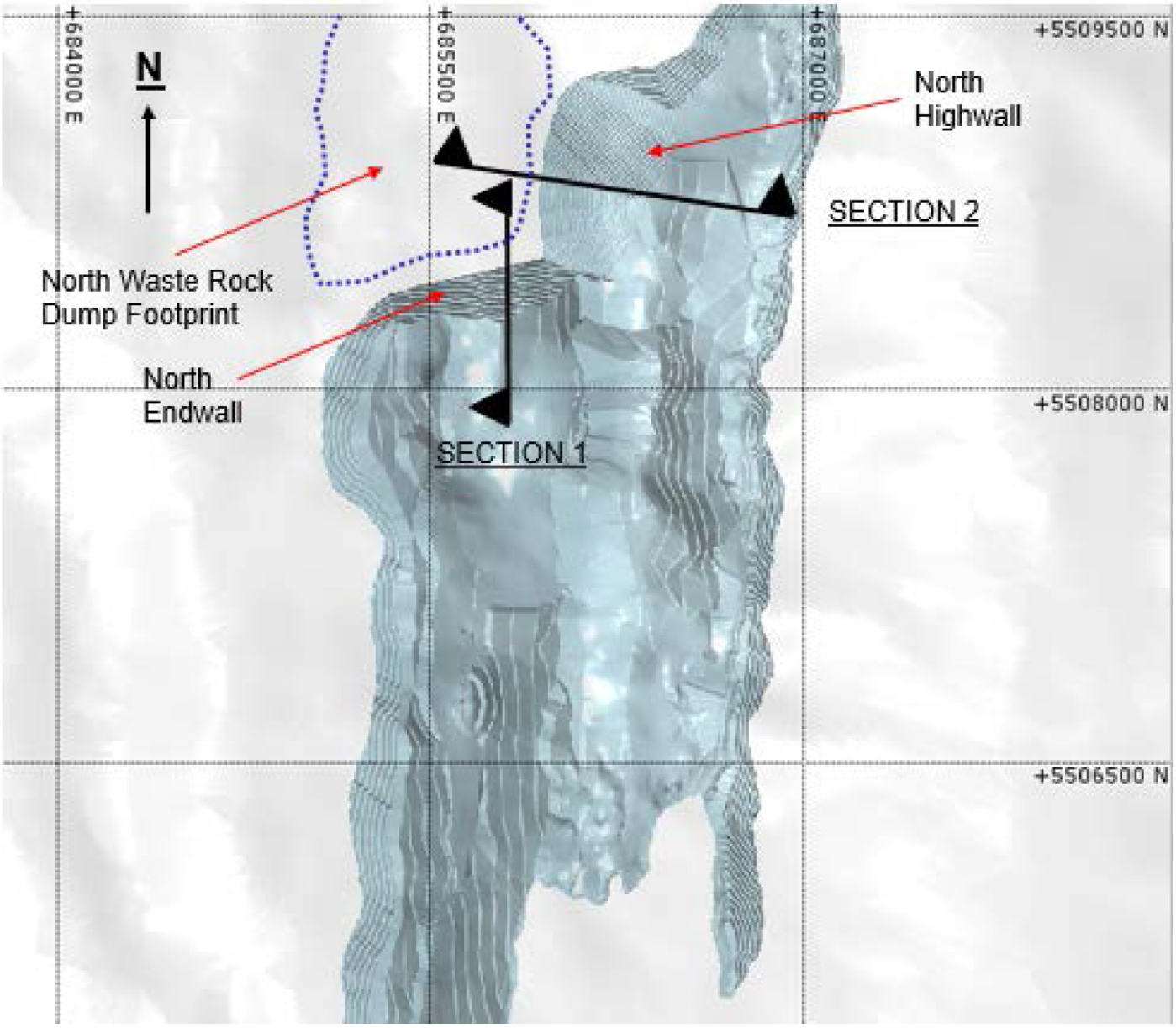
Benga understands that autonomous technology relies on highly accurate satellite and ground-based location software and hardware. In the case of Grassy Mountain with its variable topography Benga would need to better understand how this impacts on the application of the technology. Further work would also be required to understand if the haulage of coal and waste rock from the elevated locations (up to 2000m) to the ROM (elevation 1450m) could be done safely with this technology. Benga has not considered the implementation of autonomous electric vehicles at this time, given the lack of industry experience with this.

d) If the use of autonomous vehicles is, or may become, technically feasible in the life of the mine, discuss the differences in socio-economic and environmental effects that would occur from the use of this technology (i.e. difference in local employment, workforce, and air emissions including greenhouse gas emissions) including scenarios for adoption of autonomous diesel vehicles and autonomous electric vehicles.

Response:

Should autonomous vehicles become technically feasible for the Grassy Mountain Project, the technology would only be adopted if the result is determined (or proven) to be a superior outcome from an environmental perspective than the Project as applied for.

FIGURES



RIVERSDALE RESOURCES

GRASSY MOUNTAIN COAL PROJECT

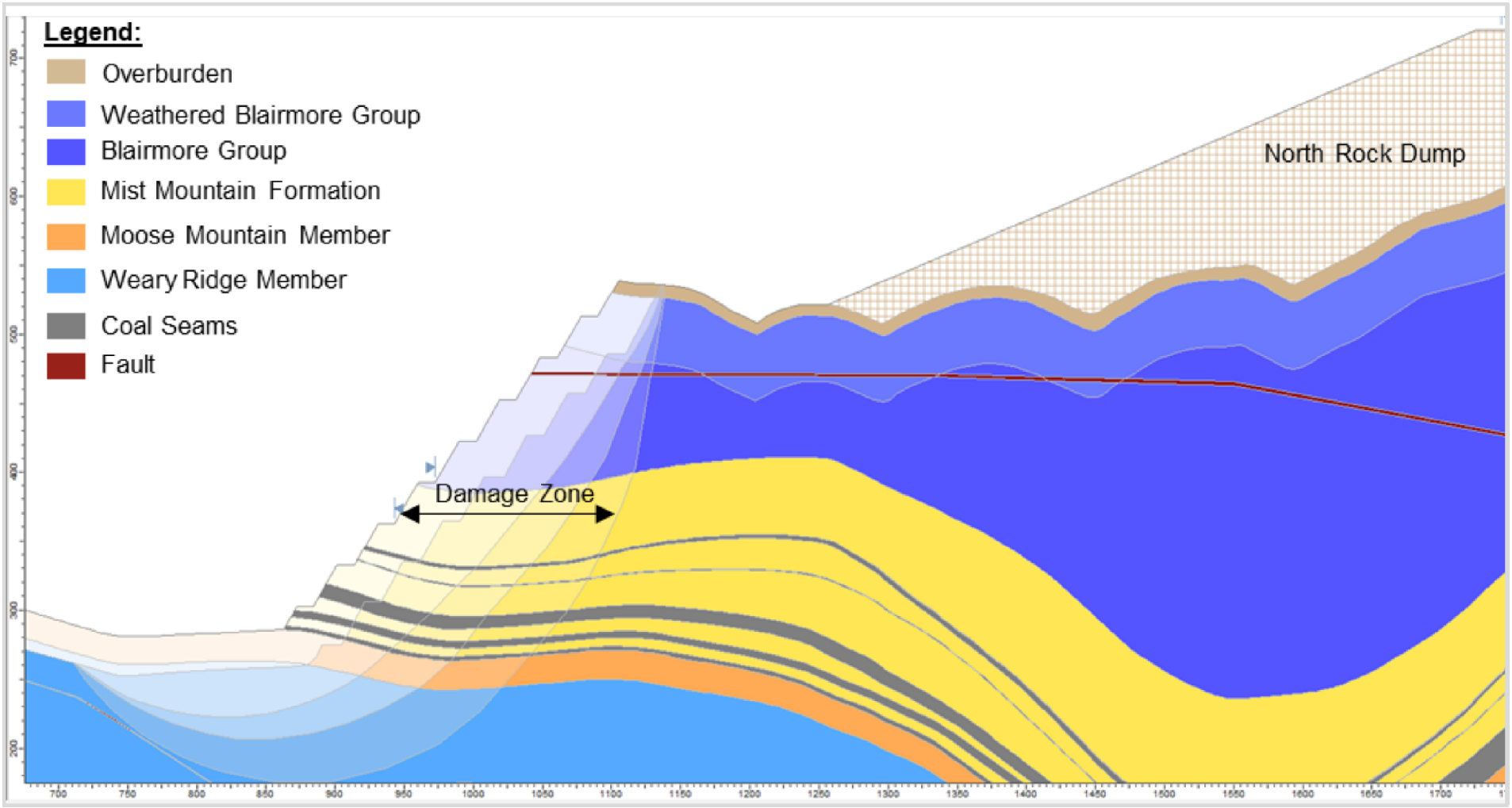
LOCATION OF STABILITY SECTIONS THROUGH THE NORTH ENDWALL AND HIGHWALL PIT SLOPES

MEMS, 2019

MILLENNIUM EMS Solutions Ltd.

PROJECT: 14-00201
DRAWN BY: JLAMBERTS
CHECKED BY: MB
DATE: JULY 9, 2019
FIGURE
3.1-1

Document Path: K:\Active Projects 2014\AP 14-00201 to 14-00250\14-00201\MXD\Final Figures\Landuse\Resubmission\Information Request 3\Fig 3-1-1 Location of Stability Sections North Endwall and Pit Slopes 14-00201.mxd



RIVERSDALE RESOURCES

GRASSY MOUNTAIN COAL PROJECT

MILLENNIUM EMS Solutions Ltd.

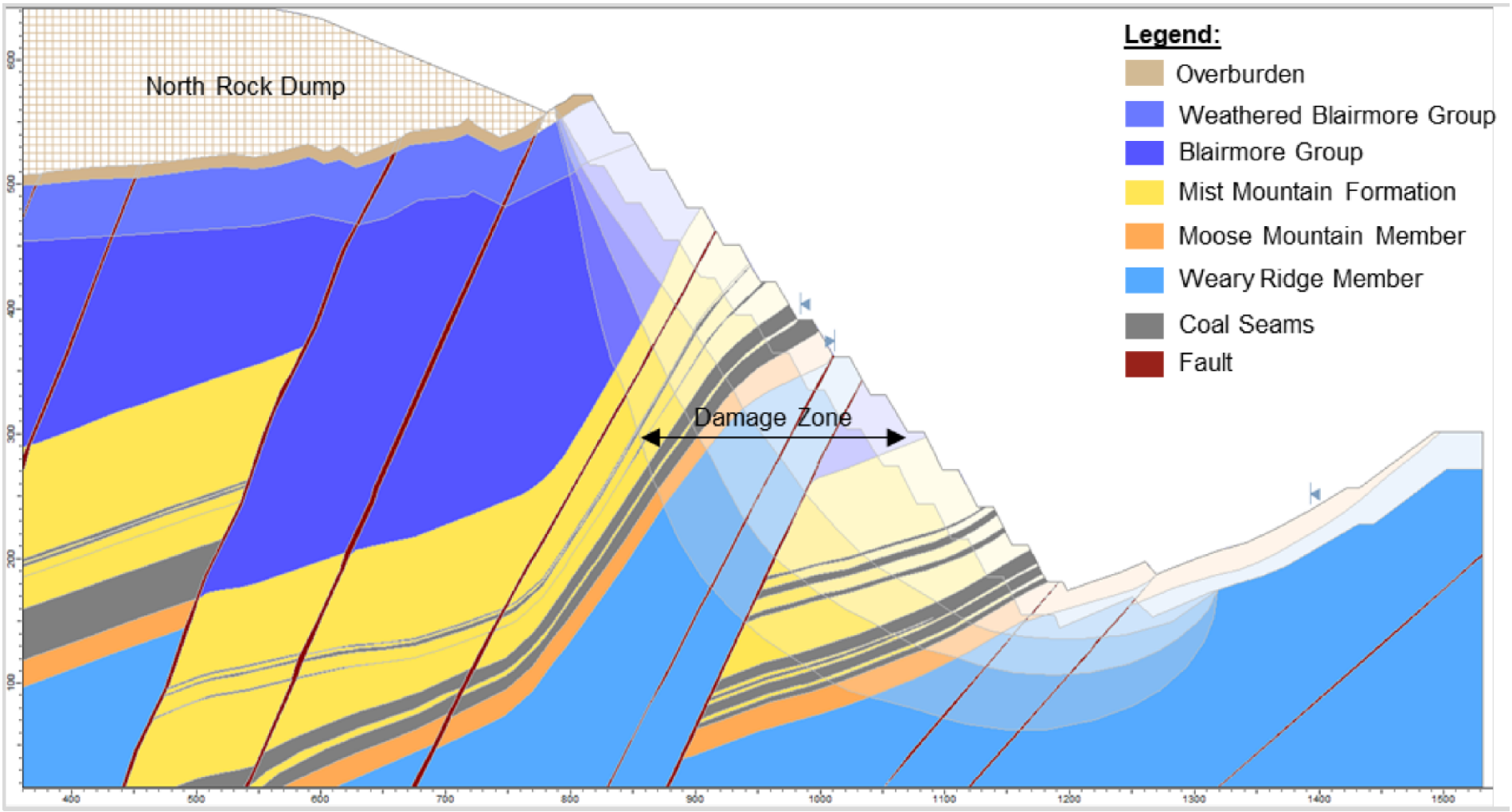
GEOMETRY OF NORTH ENDWALL MODEL (SECTION 1) INCLUDING GEOLOGICAL UNITS, DAMAGE ZONE EXTENTS AND NORTH ROCK DUMP

MEMS, 2019

PROJECT: 14-00201
DRAWN BY: JLAMBERTS
CHECKED BY: MB
DATE: JULY 9, 2019

FIGURE
3.1-2

Document Path: K:\Active Projects 2014\AP 14-00201 to 14-00250\14-00201\MXD\Final Figures\Landuse\Resubmission\Information Request 3\Fig 3-1-2 Geometry of North Endwall Section 1 14-00201.mxd



RIVERSDALE RESOURCES

GRASSY MOUNTAIN COAL PROJECT

MILLENNIUM EMS Solutions Ltd.

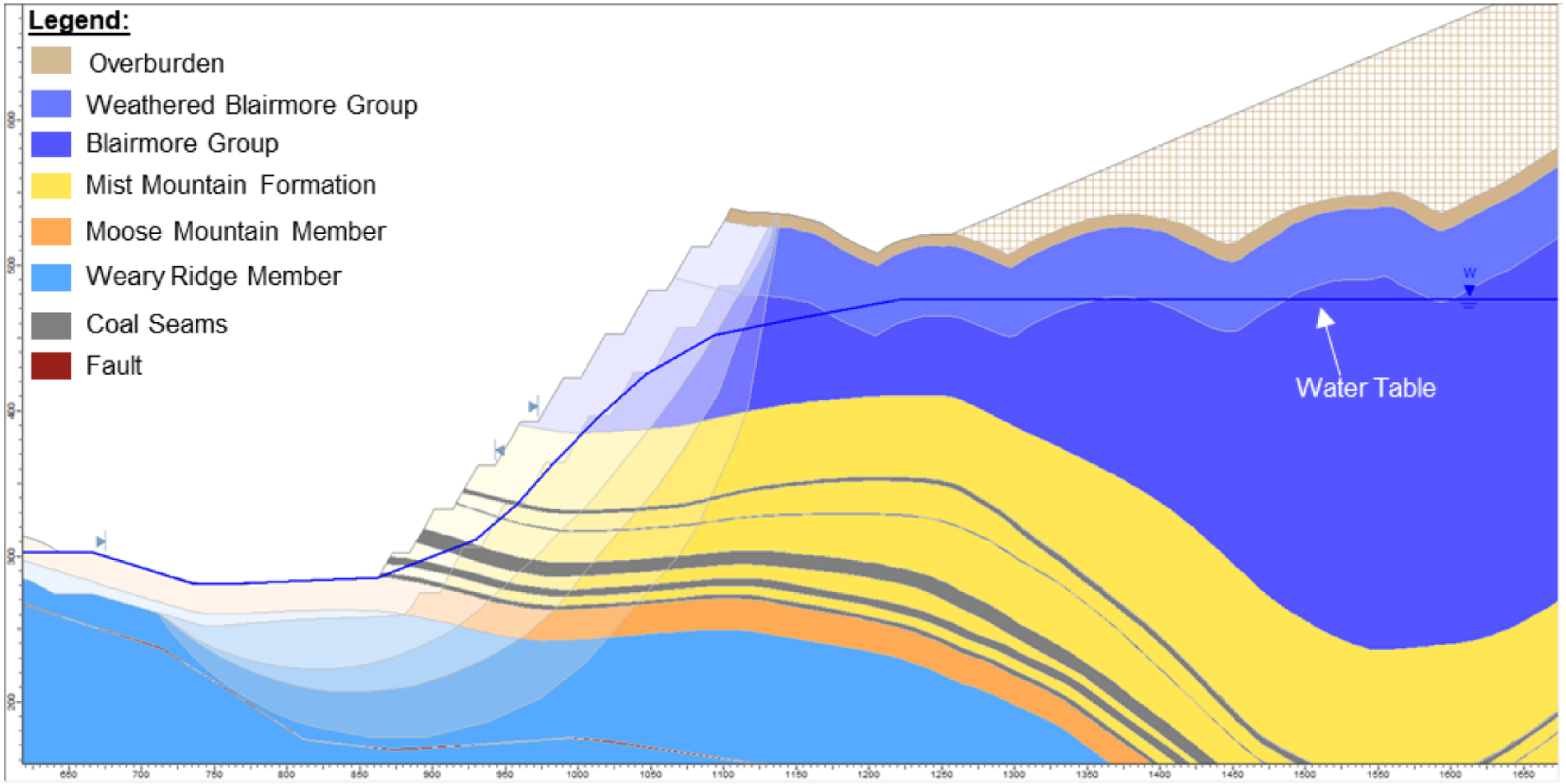
GEOMETRY OF NORTH ENDWALL MODEL (SECTION 2) INCLUDING GEOLOGICAL UNITS, DAMAGE ZONE EXTENTS AND NORTH ROCK DUMP

MEMS, 2019

PROJECT: 14-00201
DRAWN BY: JLAMBERTS
CHECKED BY: MB
DATE: JULY 9, 2019

FIGURE
3.1-3

Document Path: K:\Active Projects 2014\AP 14-00201 to 14-00250\14-00201\MXD\Final Figures\Landuse\Resubmission\Information Request 3\Fig 3-1-3 Geometry of North Endwall Section 2 14-00201.mxd



RIVERSDALE RESOURCES

GRASSY MOUNTAIN COAL PROJECT

MILLENNIUM EMS Solutions Ltd.

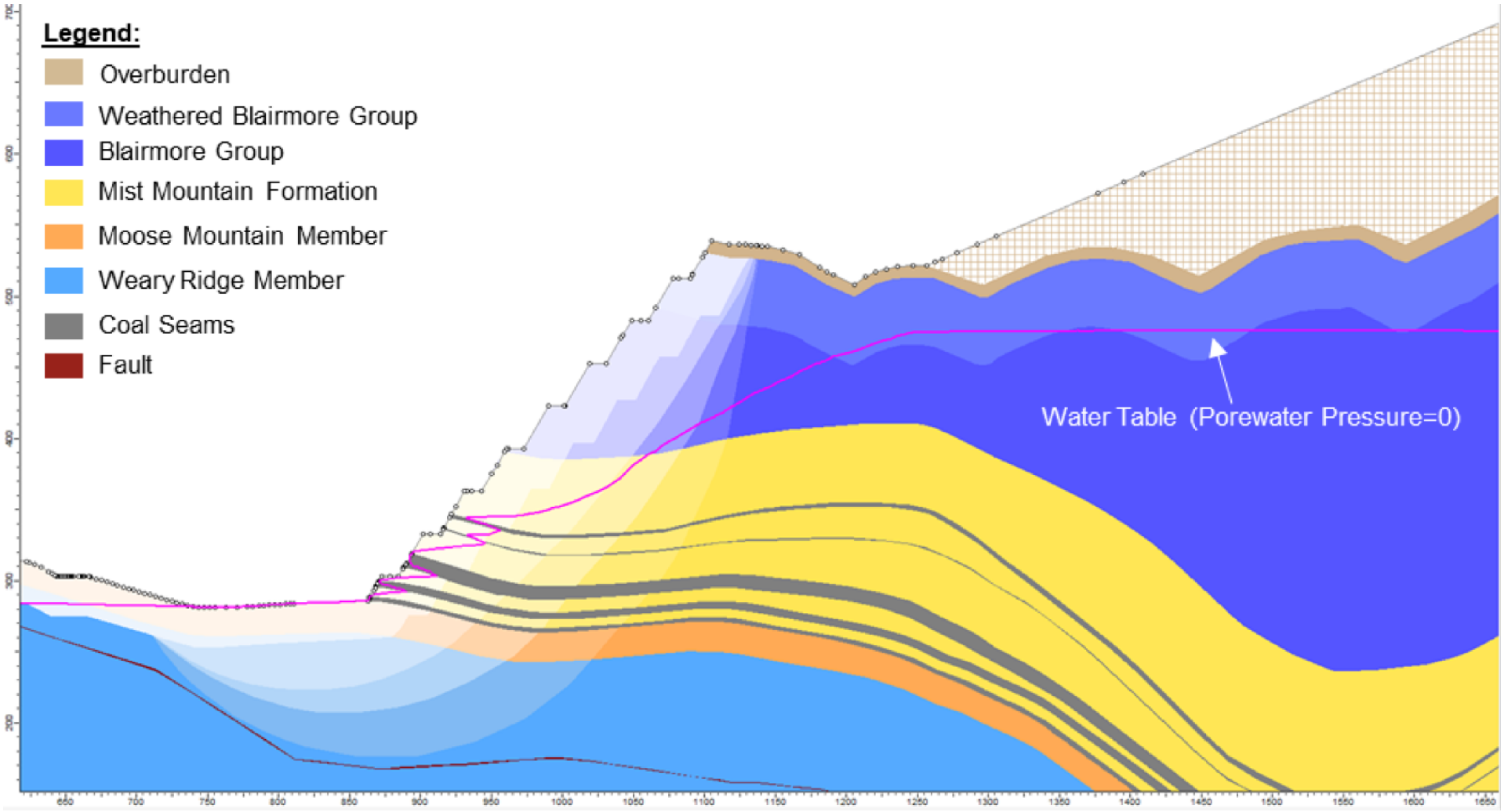
NORTH ENDWALL MODEL (SECTION 1) WITH GROUNDWATER DEPRESSURIZED TO EXTENT BLAST DAMAGE ZONE

MEMS, 2019

PROJECT: 14-00201
DRAWN BY: JLAMBERTS
CHECKED BY: MB
DATE: JULY 9, 2019

FIGURE
3.1-4

Document Path: K:\Active Projects 2014\AP 14-00201 to 14-00250\14-00201\MXD\Final Figures\Landuse\Resubmission\Information Request 3\Fig 3-1-4 North Endwall Model Section 1 14-00201.mxd



RIVERSDALE RESOURCES

GRASSY MOUNTAIN COAL PROJECT

MILLENNIUM EMS Solutions Ltd.

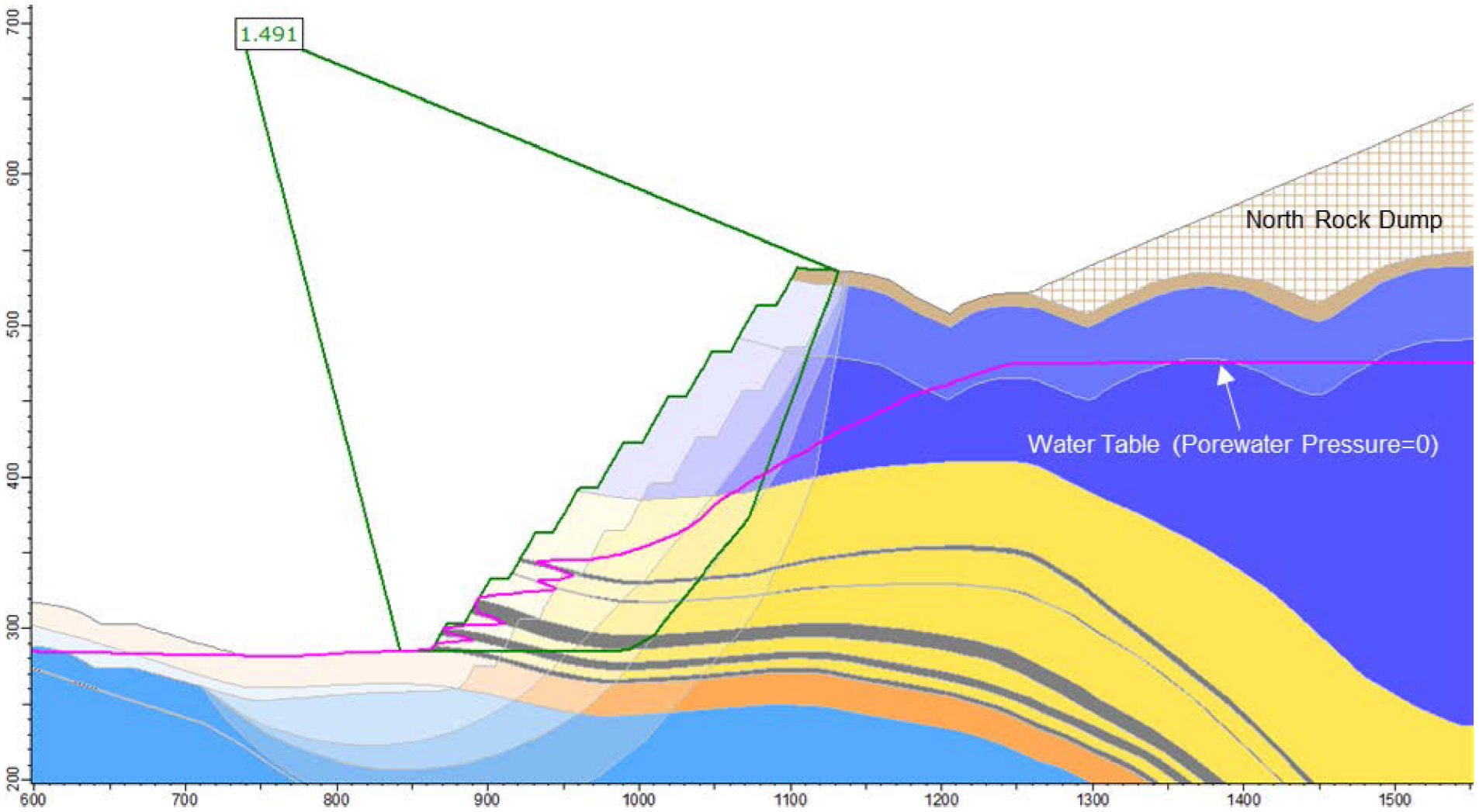
NORTH ENDWALL MODEL (SECTION 1) WITH SHOWING GROUNDWATER TABLE RESULTS FROM PPM MODEL

MEMS, 2019

PROJECT: 14-00201
DRAWN BY: JLAMBERTS
CHECKED BY: MB
DATE: JULY 9, 2019

FIGURE
3.1-5

Document Path: K:\Active Projects 2014\AP 14-00201 to 14-00250\14-00201\MXD\Final Figures\Landuse\Resubmission\Information Request 3\Fig 3-1-5 North Endwall Model Section 1 PPM 14-00201.mxd



RIVERSDALE RESOURCES

GRASSY MOUNTAIN COAL PROJECT

MILLENNIUM EMS Solutions Ltd.

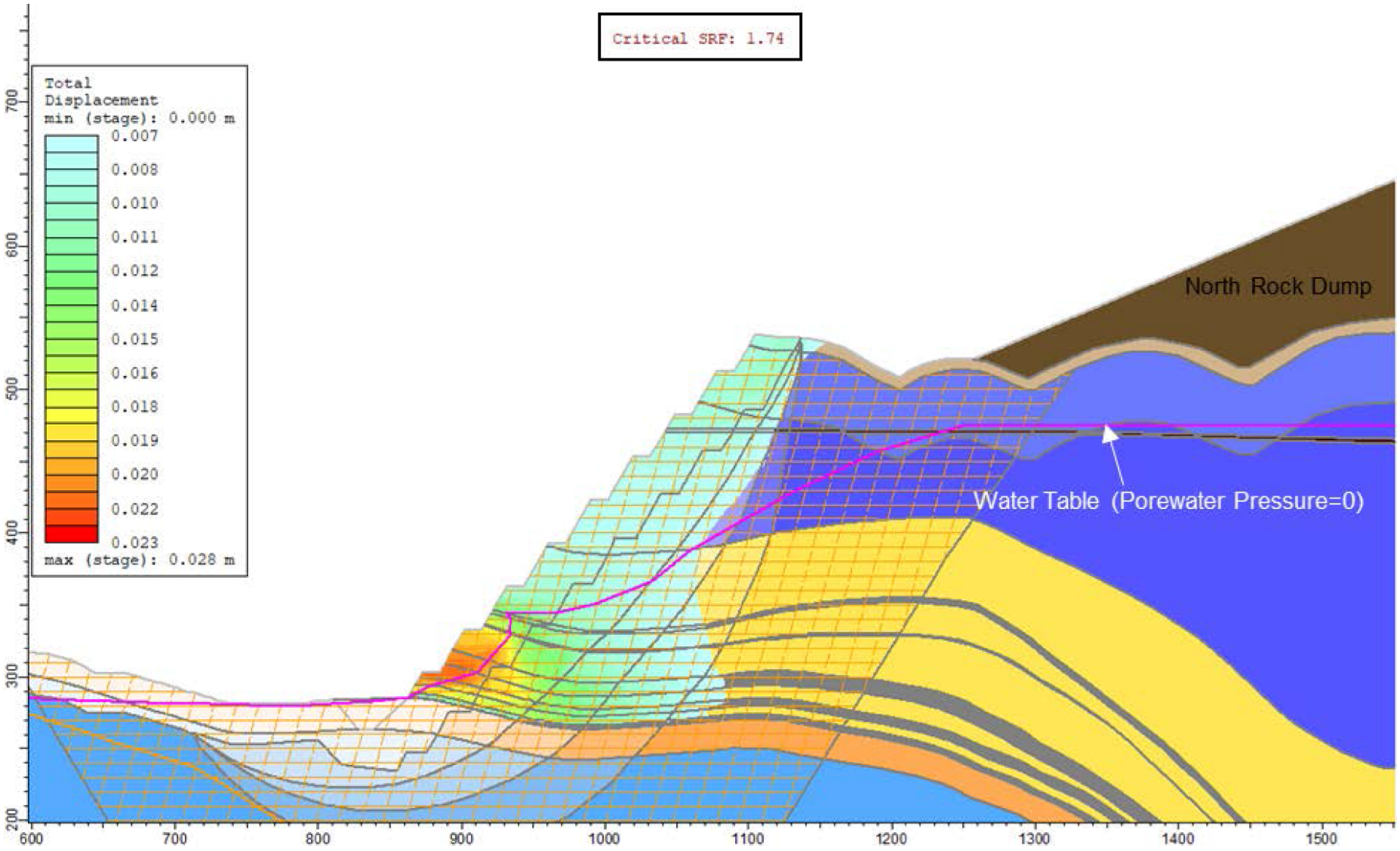
LIMIT EQUILIBRIUM ENDWALL MODEL (SECTION 1) RESULTS WITH CRITICAL FAILURE SURFACE SHOWN IN GREEN. MODEL CONSIDERS GROUNDWATER CONDITIONS CALCULATED FROM THE POREWATER PRESSURE MODEL (PPM)

MEMS, 2019

PROJECT: 14-00201
DRAWN BY: JLAMBERTS
CHECKED BY: MB
DATE: JULY 9, 2019

FIGURE
3.1-6

Document Path: K:\Active Projects 2014\AP 14-00201 to 14-00250\14-00201\MXD\Final Figures\Landuse\Resubmission\Information Request 3\Fig 3-1-6 Limit Equilibrium Endwall Model Section 1 14-00201.mxd



RIVERSDALE RESOURCES

GRASSY MOUNTAIN COAL PROJECT

MILLENNIUM EMS Solutions Ltd.

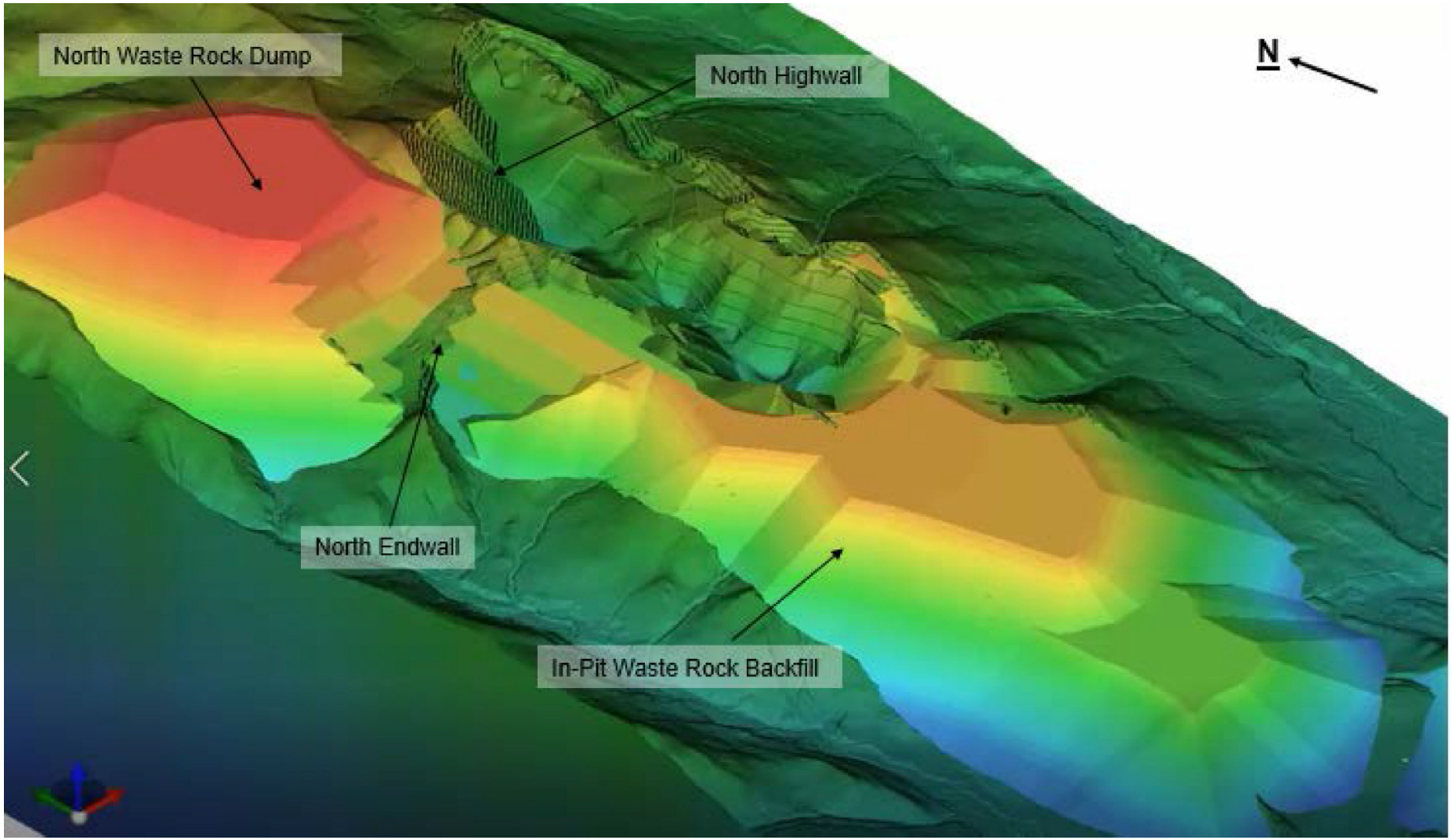
FINITE ELEMENT ENDWALL MODEL (SECTION 1) RESULTS SHOWING PIT WALL DISPLACEMENT CONTOURS. MODEL CONSIDERS GROUNDWATER CONDITIONS CALCULATED FROM THE POREWATER PRESSURE MODEL (PPM)

MEMS, 2019

PROJECT: 14-00201
DRAWN BY: JLAMBERTS
CHECKED BY: MB
DATE: JULY 9, 2019

FIGURE
3.1-7

Document Path: K:\Active Projects 2014\AP 14-00201 to 14-00250\14-00201\MXD\Final Figures\Landuse\Resubmission\Information Request 3\Fig 3-1-7 Finite Element Endwall Model Section 1 14-00201.mxd



RIVERSDALE RESOURCES

GRASSY MOUNTAIN COAL PROJECT

MILLENNIUM EMS Solutions Ltd.

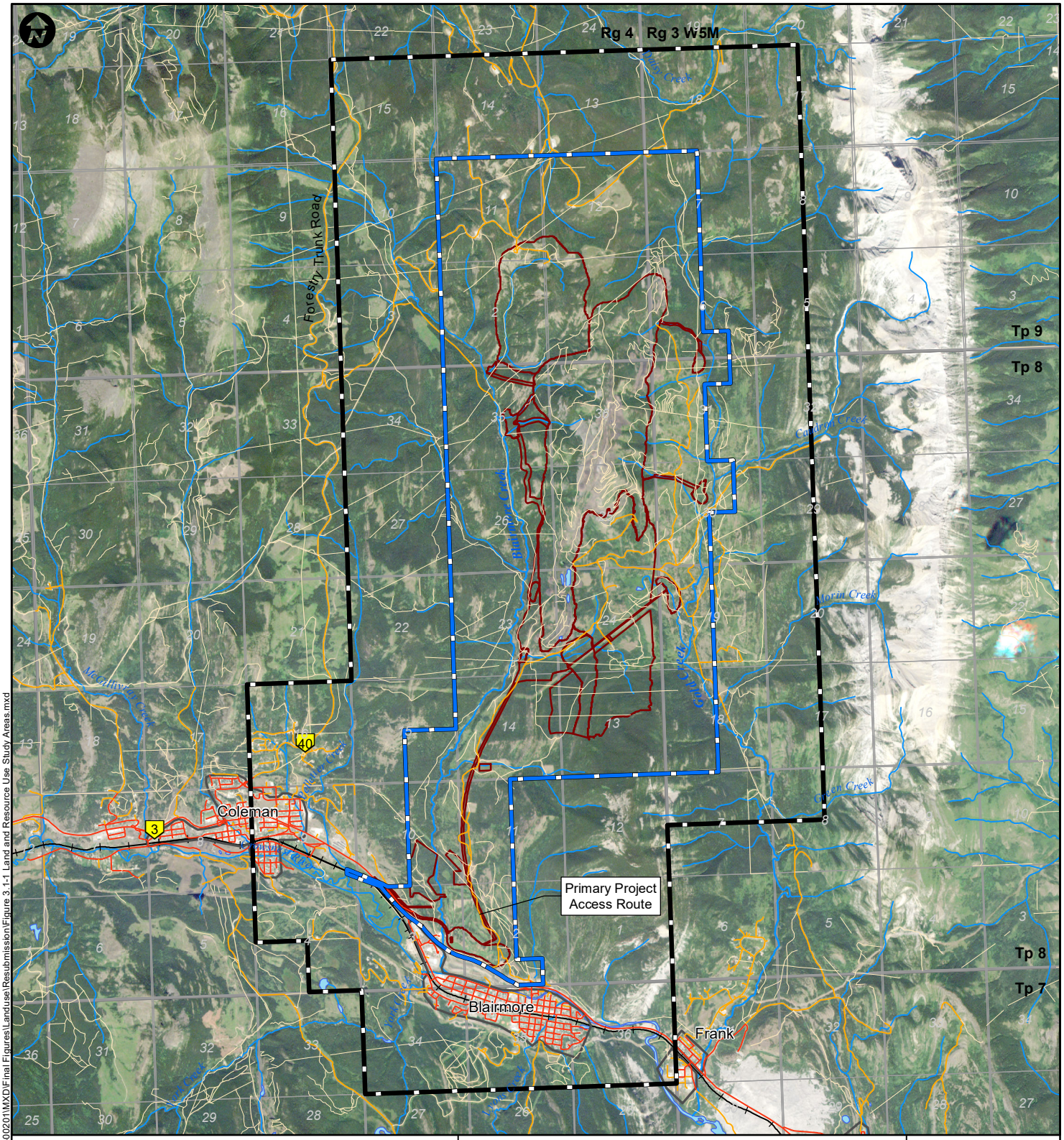
GRASSY MOUNTAIN MINE PLAN SHOWING BACKFILLED OPEN PIT AND EXTERNAL WASTE ROCK DUMPS AT COMPLETION OF MINING

MEMS, 2019

PROJECT: 14-00201
DRAWN BY: JLAMBERTS
CHECKED BY: MB
DATE: JULY 9, 2019

FIGURE
3.1-8

Document Path: K:\Active Projects 2014\AP 14-00201 to 14-00250\14-00201\MXD\Final Figures\Landuse\Resubmission\Information Request 3\Fig 3-1-8 Mine Plan Showing Backfilled Open Pit 14-00201.mxd



LEGEND

- Cutline\Trail
- Gravel Road
- Paved Road
- Existing Railway
- Surface Water Drainage
- Local Study Area
- Regional Study Area
- Project Footprint

PROJECT

RIVERSDALE RESOURCES

GRASSY MOUNTAIN COAL PROJECT

MILLENNIUM EMS Solutions Ltd.

TITLE

LAND AND RESOURCE USE STUDY AREAS

NOTES

AltaLIS, 2016; GeoBase, 2015; NRCAN, 2016; RapidEye, 2015
(Image Date: Jul 26/13); Riversdale, 2016
Datum/Projection: UTM NAD 83 Zone 11

PROJECT:	14-00201-01
DRAWN BY:	JL
CHECKED BY:	MB
DATE:	JUNE 25, 2019

0 1.5 3 6
Kilometres

FIGURE

3.5-1

Document Path: K:\Active Projects 2014\AP 14-00201 to 14-00250\14-00201\MXD\Final Figures\Landuse\Resubmission\Figure 3.1-1 Land and Resource Use Study Areas.mxd

APPENDIX 3.4-1 CONSENT LETTERS

Egbert Veldman
<contact information removed>

July 29, 2016

Keith Bott
Benga Mining Ltd
PO Box 660
Blairmore, Alberta
T0K 0E0

RE: Timber Disposition CTPC050124
Dated: 10 day of July, 2016

I have a Timber Disposition within the MSL applied for by Benga Mining within sections 1, 2, 11 & 12 of Township 9 Range 4 W5M. Benga Mining is to allow me access to the proposed MSL for the purpose of Timber Permit CTPC050124 and other future permits applied for within the MSL.

I have no objection to their proposed MSL providing the above requirement is met.

Sincerely,
<Original signed by>

Egbert Veldman

ALTALINK
A BERKSHIRE HATHAWAY ENERGY COMPANY
2611 3 Avenue SE, Calgary, Alberta, T2A 7W7
www.altalink.ca

July 21, 2016

Sent via email: <email address removed>

Benga Mining Limited
PO Box 660
12331 20th Ave
Blairmore, AB T0K0E0

ATTENTION: KEITH BOTT

RE: Proposed Coal Mine in Proximity to AltaLink 1201 Transmission Line in 23-8-4-W5M, 24-8-4-W5M, and 21-8-4-W5M

AltaLink has been notified of the proposed coal mine at the above mentioned location, in proximity to AltaLink's 500 Kilovolt, 1201 transmission line.

AltaLink has no objections to the proposed facility in proximity to AltaLink's Right of Way/Easement provided that the following conditions are met:

- Benga Mining must apply for, receive, and approve facility crossing, encroachment, or proximity agreements from AltaLink for any access routes or new facilities which cross over, encroach within, or are within less than thirty metres from the edge of AltaLink's transmission line right of way
- Benga Mining is responsible for mitigating any hazards to AltaLink's transmission line which are created or exacerbated by the presence or operation of the mine or associated facilities; including, but not limited to, falling debris, clearance beneath and around the lines, and drainage
- AltaLink must be permitted to access its transmission lines to perform routine or emergency maintenance as needed; and, Benga Mining must coordinate with AltaLink to ensure that the line and its components may be accessed safely by AltaLink personell

If you have any questions or concerns, please do not hesitate to contact the undersigned.

Respectfully,
<Original signed by>

Drew Cunningham, C.E.T.
Transmission Lines Encroachment Technologist
<contact information removed>

Devon Canada Corporation
2000, 400 - 3rd Avenue S.W.
Calgary, Alberta T2P 4H2

403 232 7100 Phone
403 232 7678 Fax
www.devonenergy.com

Via Courier

July 15, 2016

Benga Mining Limited
P.O. Box 660
12331 – 20th Ave.
Blairmore, AB T0K 0E0

ATTENTION: Anthony Martin
Director

RE: Letter of non-Objection – Coleman Area

Further to our communications on the subject, Devon Canada, on behalf of itself and its affiliates, hereby confirms that it has reviewed the materials forwarded to Devon by Benga Mining Limited ("Benga") on June 20, 2016 and June 27, 2016 relating to Benga's application to the Canadian Environmental Assessment Agency and the Alberta Energy Regulator for a mine permit at its proposed Grassy Mountain site and Devon has no objections to the materials and information presented in such materials.

To the extent there are any material changes to the proposed mining operations and plans, kindly advise us so we may review the same.

If you require further information or wish to discuss, please feel free to contact the writer at contact information removed> or via email at <email address removed>

Devon Canada, by its
Managing Partner,
Devon Canada Corporation

<Original signed by>

Vince Boden
Sr. Supervisor, Surface Land and Survey

Consent of Occupant

We Gold Creek Grazing Co-operative of Fort Macleod in the province of Alberta. IN CONSIDERATION of the sum of $1.00 and other good and valuable consideration paid to us by the mineral producer (Benga Mining Ltd.), receipt of which is hereby acknowledged, and in consideration of the covenants and agreements hereinafter mentioned and on the part of Benga Mining Ltd. to be kept, observed and performed;

We, Gold Creek Grazing Cooperative DO HEREBY CONSENT to Benga Mining Ltd., its successors and assigns, its contactors, subcontractors, servants and agents the right, license, liberty, privilege and easement to enter upon, over, under and through all those portions of:

Grazing Permit GRP870052

E ½ 14-008-04 W5M; E ½ 26-008-04 W5M

Grazing Permits PNT930299 and PNT940130

E ½ 35-008-04 W5M; NW35-008-04 W5M; 1-009-04 W5M; E½ 2-009-04 W5M; SW2-009-04 W5M; SE11-009-04 W5M; SW12-009-04 W5M; W1/2 6-009-03 W5M; E1/2 14-008-04; N1/2 13-008-04; SW 13-008-04

And made between Her Majesty the Queen in right of the Province as represented by the Regulatory body (Minister of Environment and Sustainable Resource Development or the Alberta Energy Regulator) as Lessor/Grantor and me (us) as Lessee/Grantee at any time and from time to time with vehicles and equipment for the purpose permitted by the Public Lands Administration Regulation and any regulations passed in substitution therefor.

Benga Mining Ltd. HEREBY COVENANTS AND AGREES to compensate me (us) for damage done to my (our) buildings, growing crops, fences and livestock on the said land by reason of the exercise of the rights hereby granted; and Benga Mining Ltd HEREBY COVENANTS AND AGREES to pay (us), in addition to the consideration and compensation hereinbefore mentioned the annual rent of $ 1.00 dollar, such rent being payable annually in advance on the 1st day of January in each year or portion thereof that the rights hereby granted are exercised, the first of which payments to be made on the 1st day of January, 2017.

If my (our) right to occupy the said land terminates for any reason, this consent and covenants and agreements herein contained shall then and in that event cease and determine.

This consent is given under my (our) hand expressly for the purpose of satisfying the requirements of Section 12 of the Surface Rights Act or any other relevant or applicable legislation.

This consent shall be binding upon and shall enure all the benefit of my (our) heirs, executors, administrators and assigns.

IN WITNESS WHEREOF I/WE, have executed this consent at Blairmore in the province of Alberta, this 9th day of August, 2016.

SIGNED AND DELIVERED By _____

In the presence of;

<Original signed by>

<Original signed by>

Witness Signature

Becky Houserga

_____

Occupant Signature

<Original signed by>

_____

Occupant Signature

This Consent is hereby acknowledged and accepted by Benga Mining Ltd.

<Original signed by>

Per. _____

Steve Marlyn.

Consent of Occupant - Form B

I/We, Don Driver of Fort Macleod in the Province of Alberta, IN CONSIDERATION of the sum of $1.00 and other good and valuable consideration paid to me (us) by the mineral producer (Benga Mining Ltd), receipt of which is hereby acknowledged, and in consideration of the covenants and agreements hereinafter mentioned and on the part of Benga Mining Ltd. to be kept, observed and performed:

I/We, Don Driver DO HEREBY CONSENT to Benga Mining Ltd., its successors and assigns, its contractors, subcontractors, servants and agents the right, license, liberty, privilege and easement to enter upon, over, under and through all those portions of: L15, L14, L13-31-008-03 W5M (the lands described in the lease, license, permit) numbered GRL960066 dated the 19 day of June, 1996 (expired), and GRL36801 dated the 1st day of June, 1962,and made between Her Majesty the Queen in right of the Province as represented by the Regulatory body (Minister of Environment and Sustainable Resource Development or the Alberta Energy Regulator) as Lessor/Grantor and me (us) as Lessee/Grantee at any time and from time to time with vehicles and equipment for the purposes permitted by the Public Lands Administration Regulation and any regulations passed in substitution therefor.

Benga Mining Ltd. HEREBY COVENANTS AND AGREES to compensate me (us) for damage done to my (our) buildings, growing crops, fences and livestock on the said land by reason of the exercise of the rights hereby granted; and Benga Mining Ltd. HEREBY COVENANTS AND AGREES to pay us, in addition to the consideration and compensation hereinbefore mentioned the annual rent of $ 1.00 dollars, such rent being payable annually in advance on the 1st day of January in each year or portion thereof that the rights hereby granted are exercised, the first of which payments to be made on the 1st day of January, 2017.

If my (our) right to occupy the said land terminates for any reason, this consent and covenants and agreements herein contained shall then and in that event cease and determine.

This consent is given under my (our) hand expressly for the purpose of satisfying the requirements of Section 12 of the *Surface Rights Act* or any other relevant or applicable legislation.

This consent shall be binding upon and shall enure to the benefit of my (our) heirs, executors, administrators and assigns.

IN WITNESS WHEREOF I/WE, have executed this consent at Fernie, British Columbia

in the Province of Alberta, this 10 day of August, 2016.

<Original signed by>

SIGNED AND DELIVERED

<Original signed by>

By _____

In the presence of:

<Original signed by>

_____
WITNESS

_____
OCCUPANT

_____
OCCUPANT

This Consent is hereby acknowledged and accepted by Benga Mining Ltd.

<Original signed by>

Per: _____

June 22, 2016

Keith Bott
Riversdale Resources
PO Box 660
12331 20th Ave
Blairmore, AB T0K 0E0

RE: LOC FOR RAIL LOOP NEAR BLAIRMORE, AB (SECTION 2/3, TOWNSHIP 8, RANGE 4, W5M)

ATCO Gas has facilities within the proposed LOC, under Pipeline Agreement Application (PLA) number 000472. A majority of the gas main within the proposed LOC has been abandoned.

If any portion of the gas main remains in the proposed LOC, ATCO Gas requires the remaining portion of the gas main to be abandoned. This abandonment is done at the developer's expense prior to any surface construction within the proposed LOC. Please contact the Lethbridge Engineering Department at (403) 380-5400 to arrange for a gas main abandonment.

Please contact Alberta One-Call Corporation at 1-800-242-3447 prior to any surface construction.

ATCO Gas has no objection to this proposal providing the above requirements are met.

If you require further information, please contact the undersigned at <contact information removed>

Sincerely,

ATCO Gas

<Original signed by>

Michael Leung
Distribution Design EIT, Lethbridge Region Operations
<contact information removed>

APPENDIX 3.4-2 LETTERS OF NOTIFICATION

Review Panel Manager
Grassy Mountain Coal Project
160 Elgin St. 22 Floor
Ottawa, On K1A 0H3

Dear Panel,

The purpose of this letter is to express the strong support of the Crowsnest Pass Golf and Country Club for the coal project at Grassy Mountain in Crowsnest Pass. We have been working with Riversdale Resources for the past four years on a land swap deal which would give them rail access for coal loadout, and in return we would receive replacement golf facilities for all holes and buildings displaced by the loadout. We have found them to be a good company to work with, and a real asset to our community.

From the very onset of this project, Riversdale has been involved in community affairs and events, and provides a great deal of time and money in support of local initiatives. While the golf course is probably the largest project, others include support for the local hospital association, computers for schools, a kids ski prog <Original signed by>

an equal number of new residents in support jobs, like restaurants, hotels, etcetera,. This will be a truly exciting time for the Pass and our Golf Club.

The joint project between Riversdale and the Golf Club is a good demonstration of how industry and tourism can co-exist, and even be located right next to each other. We have always had a nice golf club here in the Pass, but thanks to Riversdale and the Grassy Mountain Coal Project, we will have an excellent, modern facility which will serve the members and community well into the future. We will also have a new member base to help replace our retiring membership, and to help secure our financial viability going forward. Riversdale will have their needed rail access. And our town will have the economic boost we have been waiting for for so long.

Respectfully submitted,

Rob Amatto
President, Crowsnest Pass Golf and Country Club

RIVERSDALE
RESOURCES

July 11, 2019

Kevin Topolnicki
Wildfire Prevention Officer
Calgary Wildfire Management Area
Agriculture and Forestry
8660 Bearspaw Dam Road NW
Calgary, Alberta, T3L 1S4

Re: Reservation/ Activity Number CNT 090027
Coal Mining Application for Proposed Grassy Mountain Coal Project
Application No. 1844520 & 1902073 (formerly 1844522)
Location: TWP 8&9, RNG 3&4, W5M

Dear Kevin Topolnicki:

Benga Mining Ltd. (Benga), a wholly owned company of Riversdale Resources, filed an integrated application for the Grassy Mountain Coal Project (the Project) on August 15, 2016, and subsequently filed an amended *Public Lands Act* application in November, 2017. As part of the requirements of the Public Lands application, Benga is providing this notification letter to illustrate that the Project is in alignment with the conditions of the Consultative Notation (CNT) 090027.

As per CNT 090027, Benga will prepare a Wildfire Control and Prevention Plan in accordance with the FireSmart Wildfire Assessment System. This plan will be updated annually for each wildfire season. This plan includes on-site fire prevention and control equipment, communication procedures as well as off-site communication with the public and firefighting authorities and cooperative efforts in regional fire prevention and control. Fire prevention, detection, reporting, and suppression measures are the basis of this plan. The FireSmart Wildfire Assessment System will also be referred to by Benga when developing new mining areas in further effort to decrease the chance of a wildfire caused by industrial activities. The plan is outlined in Attachment 1.

If you have any questions or would like to discuss this further, please contact Tyler Riewe, Senior Manager Safety, Health and Environment by email at t <contact information removed> or by telephone at <contact information removed>

Regards,
<Original signed by>

Gary Houston
VP, External Affairs

Encl. Attachment 1

Attachment 1

The following is an outline of the Wildfire Control and Prevention Plan, provided in the Project's Environmental Impact Assessment (EIA) (August 2016).

Wildfire Control and Prevention Plan

1.0 INTRODUCTION

Benga has followed the FireSmart Guidebook for the Oil and Gas Industry (FireSmart Guidebook) (GoA 2008) as a guideline for their Wildfire Control Plan (WCP). Although the Project is a coking coal project, these guidelines still apply by:

- enhancing personnel safety during a wildfire event;
- enhancing emergency response capability;
- mitigating economic impact during shutdowns;
- mitigating infrastructure loss or damage; and
- reducing liability for industry-caused ignitions.

To address the dynamic nature of the Project over time, Benga proposes to review and, if needed, adapt the WCP annually.

The FireSmart Guidebook uses the following three zoning scales for assessing the threat of wildfires on oil and gas dispositions:

- Industrial Zone 1: 0-10 m from structures on the disposition;
- Industrial Zone 2: 10-30 m from structure(s) on the disposition; and
- Industrial Zone 3: 30 m or more from structures, extensive forest area surrounding individual or multiple dispositions.

As these zones are specific to oil and gas dispositions, Benga has altered the zoning to better assess the threat of wildfires for the Project. The altered zoning structure is:

- Industrial Zone 1: 0-10 m from the Coal Handling and Processing Plant (CHPP) and mine infrastructure area (MIA);
- Industrial Zone 2: all areas within the disturbance footprint, except those included in Industrial Zone 1; and
- Industrial Zone 3: all areas within the Mine Permit Boundary, except those included in Industrial Zones 1 and 2.

2.0 WILDFIRE PLANNING AND MITIGATION

Benga incorporated industry best management practices and recommendations from the Firesmart Guidebook into their wildfire prevention and mitigation strategies. Descriptions of structures and mitigations are below.

PO Box 660 | 12331 20th Avenue | Blairmore, AB T0K 0E0 403 753 5160 rivresources.com

2.1 Structures

2.1.1 Coal Handling and Processing Plant (CHPP) Services Buildings

All CHPP services buildings' exteriors are constructed with non-combustible siding and roofing. These buildings have a minimum setback of 10 m from all forest vegetation, on-site vegetation, and hydrocarbon storage. Reagent storage will be designed and installed to Canadian Standards. The CHPP's fire protection system will be designed for early fire detection, emergency warning and capability for pro-active response to an emergency fire situation. The CHPP fire protection system will be designed and installed in accordance with National Fire Protection Association (NFPA) 24 and consist of the following:

- fire water tank and pumping system (including back up diesel pump);
- maximum system operating pressure but will not be less than 1,035 kiloPascals (kPa);
- fire water pipeline servicing the CHPP and materials handling facilities, CHPP control room site offices, and workshop facilities;
- hand-activated manual alarm and fire protection activation panels located throughout structures and buildings;
- sounder and beacons located throughout structures;
- fire hose reels located throughout structures;
- 9-kg dry chemical powder portable fire extinguishers covered with polyvinyl chloride (PVC) clear cover located throughout structures;
- dry pipe sprinklers at head and tail ends of conveyors within enclosed stations and at elevated sections of conveyors higher than 12 m;
- wet pipe sprinklers along the full length of conveyors within enclosed and heated galleries;
- sub fire alarm panels located on specific structures;
- smoke detection in the form of aspirated smoke detection systems located on specific structures;
- 5-kg CO_2 portable fire extinguishers located throughout structures;
- Class II hose station covered with foam depot boxes for hazard areas;
- fire alarm panels located on specific structures;
- point type smoke detection in the office areas;
- probe type heat/smoke detectors with alarms to stop the conveyor; and
- sub-fire indicator panels with automatic detection and alarm system for fault detection in the CHPP switchrooms (fire suppression has not been included in the CHPP switchrooms; however, it can be retrofitted in the future if required.)

The overland conveyor and rail loadout facility are part of the CHPP, but, due to their locations relative to the rest of the CHPP buildings, their fire hazard level has been assessed separately.

The CHPP buildings will be a combination of demountable style buildings, engineered buildings, and fabric structures, all of which are designed for safe operation in all seasons.

2.1.2 Mine Infrastructure

The fire protection system for the MIA will be designed for early fire detection, emergency warning and capability for pro-active response to an emergency fire situation. The fire protection system will be designed and installed in accordance with NFPA 24 and consist of the following:

- fire water tank and pumping system (including back up diesel pump);
- maximum system operating pressure but will not be less than 1,035 kPa;

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- fire water pipeline servicing all of the MI facilities;
- hand activated manual alarm and fire protection activation panels located throughout the buildings;
- sounder and beacons;
- fire hose reels and 9 kg DCP portable fire extinguishers c/w PVC clear cover located;
- sub fire alarm panels located in the administration offices;
- 5 kg CO_2 portable fire extinguishers located adjacent to electrical service facilities;
- Class II hose station c/w foam depot boxes for hazard areas; and
- point type smoke detection in the office areas.

The facilities included in the MIA are listed below and are further described in Section C.6 of the EIA (August 2016). The construction camp is part of the MIA and will be included in the mine infrastructure's fire protection system described below; however, due to its location relative to the rest of the MIA, its fire hazard level has been assessed separately.

- administration building (*i.e.*, mine dry, crib rooms, car parking);
- warehouse;
- heavy vehicle workshops x 4;
- wash bay;
- cold storage;
- lube storage;
- fuel farm;
- emergency response (including first aid);
- potable and waste water treatment plants;
- propane facility;
- electrical substation and distribution;
- site security; and
- storage yards.

The MIA facilities will be a combination of demountable style buildings, engineered buildings and fabric structures and will be designed for safe operation in all seasons.

To further reduce the risks of a fire, Benga will implement the following mitigation measures for hydrocarbon storage:

- storage tanks will be required to have leak prevention measures installed and spill containment features present (berms, ditches, *etc.*);
- all incidents of hydrocarbon spills on site will be cleaned immediately to reduce the presence of flammable substances;
- storage tanks will be sealed or vented in a way that prevents airborne embers from entering; and
- vegetation will be removed away from all hydrocarbon storage tanks to a distance of 5 m.

2.1.3 Power and Transmission Lines

At this time, all power and transmission lines are owned and operated by independent utility companies. These companies manage clearing widths and vegetation management for their dispositions.

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2.2 Site Operations

2.2.1 All-Terrain Vehicle Activities

Utility vehicles (UTVs) are a key mode of transportation for employees and contractors at the Grassy Mountain Coal Mine. UTVs present a fire hazard due to the temperature of the exhaust system, which may ignite accumulated or nearby vegetation. To reduce the risks of a fire, Benga has set out the following mitigation measures:

- All UTV operators are required to undertake a certified UTV operations course.
- As part of the Riversdale Resources Safety Induction, UTV operators are advised to ensure to park the ATV on gravel or bare mineral soil and to regularly inspect the UTV's exhaust system and to remove any accumulated vegetation.
- Operators will not drive through forested vegetation (*i.e.*, off trail).
- Operators are instructed to inspect their UTVs more often if traveling through muskeg and peat areas.
- During prolonged periods of extreme fire danger levels and forest closures, Benga will monitor (and as necessary restrict) the use UTVs.
- UTVs are to be regularly maintained and kept clean to prevent the buildup of vegetation in areas of risk.
- All UTVs are equipped with fire extinguishers.

2.2.2 Heavy Equipment Activities

Heavy equipment will be used extensively on site for mining and clearing activities. Exhaust systems associated with heavy equipment can cause wildfire ignition. To reduce the risks of fire, Benga has set out the following mitigation measures:

- Contractors and staff are instructed to inspect and clean their equipment's exhaust systems on a regular basis.
- Whenever possible, all cleaning should be done on bare mineral soil, or on an area that has been recently sprayed down with water.
- While cleaning on mineral soil, operators with diesel engines are encouraged to throttle up in an attempt to expel any loose carbon particles.

2.2.3 Brush/Vegetation Clearing

Burning woody debris presents an increased risk for ignition of wildfire, especially if the piles are not properly extinguished. Benga does not intend to dispose of debris through burning. All non-salvageable timber and brush will be chipped or windrowed to promote vegetation growth on disturbed areas.

2.2.4 Industrial Zone 1 and 2 Vegetation Management

To reduce wildfire risk, Benga will ensure permanent structures in Zones 1 and 2 are at least 10 m from any vegetation and at least 30 m from forested areas. Vegetation removal activities will be carried out along the border of forested areas that are adjacent to cleared Industrial Zone 1 areas containing permanent structures (*i.e.*, MIA and CHPP). Ground cover in Zone 1 areas will be maintained as bare mineral soil, gravel, or mowed grass.

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The majority of Industrial Zone 2 areas are free of vegetation and are either gravelled areas surrounding infrastructure within Industrial Zone 1 or areas where mining operations are being undertaken. In Zone 2 areas, vegetation management will depend on the values at risk. If values at risk warrant protection, areas will be maintained as vegetation-free zones or a mowed grass. If risk does not warrant this extreme level of management, vegetation reduction will be implemented if flammable coniferous forest vegetation is present.

2.3 Emergency Response

2.3.1 Personnel Safety

To insure the safety of all employees and contractors on site, Benga provides mandatory annual safety inductions, which review wildfire prevention, wildfire preparedness, and emergency response plans for the Grassy Mountain site. The safety induction also outlines:

- evacuation staging areas and plans;
- evacuation and emergency alerts/sirens;
- evacuation routes for use during a wildfire event;
- methods of transportation for evacuation (air and ground); and
- communication requirements during an emergency.

Emergency contact lists are kept available and are updated regularly. If a wildfire occurs near or within the Project area, mine shutdown procedures will be followed and the number of staff onsite will be reduced to needed personnel. The number of personnel onsite will depend on the severity of the wildfire and its proximity to the mine.

2.3.2 Emergency Response Team

Benga is committed to having an Emergency Response Team (ERT) for the Project. Benga will implement an Emergency Response Plan for various emergency situations. As part of the Emergency Response Plan, an ERT will be set up and trained to assist in:

- fires;
- extrication of trapped persons;
- care of injured persons;
- chemical spills; and
- other emergencies.

Detailed emergency response plans will be specifically designed for various sites and will be present throughout in areas such as the Plant, office complex, maintenance and light duty machine shops, fuelling stations and pit operations are in place. These specific plans will rely on personnel training, leadership and communication between team members and all involved parties.

2.3.3 Communication

Local Fire/Rescue and Wildfire authorities are regularly apprised of the site, including the Emergency Muster Point, and are provided with a map of the site trails. Site tours are conducted annually with these authorities. All local emergency response radios are programmed with Benga's radio frequency.

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Prior to any operations/exploration, Wildfire Alberta will be contacted and advised of the operations, locations, start dates, and end dates.

2.3.4 Evacuation Plans and Staging Areas

Benga's Evacuation Plan outlines procedures and routes to be taken. This plan is reviewed annually by employees and contractors during their required Safety Inductions.

There are two access routes to the Grassy Mountain site. The main Grassy Mountain Road runs 8 km north (to the site) of Highway 3, 500 m west of Center Access to Blairmore, Alberta. The second access runs south from the Devon/Caseca Road (also known as Teddy's Trail).

Three potential helicopter landing areas have been identified. The coordinates (UTM Zone 11, NAD 83) for these areas are:

- north helicopter landing area: 686992E, 5509923N;
- top of Grassy Mountain: 686036E, 5506876N;
- south landing area: 685561E, 5504304N.

A construction/exploration phase staging area and an operation phase staging area have been identified for the mine. The construction/exploration phase staging area will remain the primary muster point during wildfire events until the mine is operational; at this time the operation phase staging area will become the primary muster point.

During the construction/exploration phase, the Site Emergency Muster Point is located at:

- Latitude 49.67083° and Longitude 114.425° or
- UTM Zone 11, NAD 83 685789E, 5505217N

During operations, staging will operate out of the MIA and CHPP area and the coal loadout facility, located at:

- CHPP and MIA:
  - UTM Zone 11, NAD 83 685063E, 5504029N; and
  - Latitude 49.66038°, Longitude -114.435620°.
- coal load-out facility:
  - UTM Zone 11, NAD 83 684211E, 5499119N; and
  - Latitude 49.616521°, Longitude -114.449720°.

2.3.5 Water Sources

Water sources for the CHPP and MIA are described below.

2.3.5.1 Coal Handling and Processing Plant

Raw water will be pumped from the raw water pond located adjacent to the CHPP product stockpile. A buried pipe will be placed through the dam wall and underground into the raw water pump house. Two pumps (one duty and one standby) will pump water through buried pipes, which will run adjacent to the product stockpile pad and up to the CPP area to the fire water tanks and to the CPP plant clarified water sump (SM-9101).

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An alternative option to the dam wall buried pipes would be to have the pump station on a floating barge to capture clear water near the surface of the pond. The barge would be horizontally stabilized over the deepest section of the raw water pond and allowed to float vertically.

The fire water tanks provide a combined fire/wash down water distribution network for both the CHPP and MIA facilities.

The nominal water make up requirement for the CHPP is 110 litres per RMT.

The CPP will be designed to maximise re-use of various water streams to reduce the raw water demands. Gland seal water, flocculant make up and filter press sprays will be sourced preferentially from the CPP clarified water to reduce raw water demand

Fire and Wash-down Water

Fire and washdown water will be reticulated in a common system for both the CHPP and TLO areas. The source of water for the CHPP system will come from the site CHPP raw water dam and the source of water the Train Load-Out (TLO) will come from the town potable water supply.

The fire water system will be used for both fire and washdown water purposes.

An electric duty washdown water pump will operate continuously catering to washdown water / other water requirements, using the one and the same reticulation network. This washdown water pump will also act as a system pressurisation pump (jockey pump).

An electric duty fire water pump will be installed in parallel and will start only in an unforeseen event of a fire. This pump will supply the fire water demand over and above the operating washdown pump.

A diesel fire water/washdown water standby pump will be installed so that in an unforeseen event of a fire and a power outage, both the firewater and washdown water demands are met. In the event of a fire, operations should cease using washdown water.

Where the fire/wash water distribution pipe is not installed inside heated structures and enclosures, it will be buried underground in accordance with geotechnical and regulatory recommendations that will prevent the pipes from freezing. This will be achieved either by burying below the frost level, or by installing insulation and heat tracing around the buried pipes.

Each of the fire water pumping facilities for the CHPP and TLO areas will be equipped with the following:

- one 100% Duty Fire Pump Set: Horizontal Centrifugal Type - Electric Driver;
- one 100% Duty Washdown Pump Set: Horizontal Centrifugal Type - Electric Driver; and
- one standby combined fire/washdown water Pump Set: Horizontal Centrifugal Type - Diesel Driver.

Fire water pumps will comply with the requirements of NFPA 20. Each fire pump set will have a duty flow and head capable of supplying the fire water demand to the largest active fire suppression system, external, and/or internal fire hydrant demands.

Fire and Wash-down Water Storage Tanks

Separate storage tank systems are proposed for the CHPP and the TLO area. Two 300,000 L and two 220,000 L capacity tanks will be provided in the CHPP and TLO areas respectively to ensure that fire water will be available, should an area single tank be out of service for maintenance or repair. The tanks are sized for additional wash down water capacity.

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Wash-down Water

Wash-down water will be provided in CHP stations, bins and in the CHPP at each floor adjacent to each set of stairs. Wash-down water will be supplied from the same system (pump and tanks) that supply the CHPP fire water system. Wash-down water will generally be provided through 25 mm hoses in the CHP stations and CHPP. Additional hose connections and ball valves will be provided at other locations as necessary.

2.3.5.2 Mine Infrastructure Area

Fire and Wash-down Water

Fire and wash-down water will be reticulated in a common system around the MIA. The source of water for this system will come from the fire water system located adjacent to the CHPP.

Where the water distribution pipes are not installed inside heated facilities, it will be buried underground in accordance with regulatory recommendations that will prevent the pipes from freezing.

Wash-down water will generally be provided through 25 mm hoses located around the MIA area. Additional hose connections and ball valves will be provided at other locations as necessary.

2.4 Communication

2.4.1 Internal Communication within the Coal Industry

Benga is committed to continually improving their operations. Industry best practices will be reviewed annually and applicable changes will be made to operations, including the Wildfire Protection Plan.

2.4.2 Industrial Wildfire Control Plan

Industrial Wildfire Control Plans are mandatory under Alberta's *Forest and Prairie Protection Act*. Benga will annually update the Project's Wildfire Control Plan to account for changes in wildfire risk and prevention measures.

2.4.3 Wildfire Reporting

Benga will report all wildfire sightings/occurrences to the local fire/rescue and wildfire authorities and to the AEP's wildfire reporting center at 310-FIRE (3473). Wildfire sightings by remotely located staff or contractors will be reported to the mine office *via* Benga's emergency mine radio frequency. Mine radios will then be used to inform all contractors and staff on site of the situation.

3.0 INDUSTRIAL FIRE ASSESSMENT

A summary of Benga's FireSmart assessment, based on the structures and mitigations described in Sections 1.0 and 2.0 above, is provided in Table 1.

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Table 1 Grassy Mountain Coal Project FireSmart Assessment		
Assessment Component[1]	Hazard Level	Mitigation Required
Zone 1 & 2 – Location and Industrial Assessments of Structures and Ignition Potential		
CHPP		
Location[2]	Low	No
Slope[3]	Low	No
Structural materials[4]	Low	No
Flammable material storage[5]	Low	No
On-site vegetation[6]	Low	No
Overland Conveyor		
Location[2]	Low	No
Slope[3]	Low	No
Structural materials[4]	Low	No
Flammable material storage[5]	Low	No
On-site vegetation[6]	Low	No
Rail Loadout Facility		
Location[2]	Low	No
Slope[3]	Low	No
Structural materials[4]	Low	No
Flammable material storage[5]	Low	No
On-site vegetation[6]	Low	No
Mine Infrastructure Area		
Location[2]	Low	No
Slope[3]	Low	No
Structural materials[4]	Low	No
Flammable material storage[5]	Low	No
On-site vegetation[6]	Low	No
Construction Camp		
Location[2]	Low	No
Slope[3]	Low	No
Structural materials[4]	Low	No
Flammable material storage[5]	Low	No
On-site vegetation[6]	Low	No

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Table 1 Grassy Mountain Coal Project FireSmart Assessment		
Assessment Component[1]	**Hazard Level**	**Mitigation Required**
Zone 3 – Assessment of Vegetation Fuel[7]		
Vegetation flammability Quadrant 1 NW	Medium	Yes
Vegetation flammability Quadrant 2 NE	Medium	Yes
Vegetation flammability Quadrant 3 SW	Medium	Yes
Vegetation flammability Quadrant 4 SE	Medium	Yes
Assessing Liability		
ATV Activity[8]	Low	No
Disposal of Debris by Burning[9]	Low	No
Assessing Emergency Response Capability		
Assessing Personnel Safety[10]	High	Yes
Wildfire Evacuation	Evacuation plans are in place	
Access Roads and Water Sources[11]	Low	No
Evacuation Routes[12]	Low	No

[1] From FireSmart Guidebook for the Oil and Gas Industry (GoA 2008).
[2] Structure within 20 m to 30 m of forest – Low; Structure within 10 m to 20 m of forest – Moderate; Structure within 10 m of forest – High.
[3] Ignition potential is based on a combination of structure's distance from crest of slope (> 100 m, <100 m) and position on slope (base, mid-slope, upper slope).
[4] Ignition potential is based on combination of building materials, openings, loading dock base, distance from petroleum products and combustibles.
[5] Ignition potential is based on presence of hydrocarbons, flammable material rating, potential for accumulation of airborne embers on tanks, and distance from storage sites to forest vegetation.
[6] On-site vegetation is defined as grass, shrubs, and trees inside the fence line. None or >10 m from structure – Low, 3 m to 10 m from structure – Moderate, <3 m from structure – High.
[7] Based on species composition and forest age, surface vegetation continuity, and presence of ladder fuels that help carry a surface fire up a tree to the crown.,
[8] Ignition potential is based on a combination of frequency of UTV exhaust system inspection during fire season and where UTVs are parked or operated (mineral soil/gravel or forest vegetation).
[9] No debris will be disposed of by burning.
[10] High hazard level is high due to number of on-site daily personnel being greater than five.
[11] Hazard level is based on a combination of access road width, vegetation flammability along access road, presence/absence of ring road, and water supply (hydrant; pits, tanks, natural source; or alternative supply)
[12] Hazard level is based on a combination of identified evacuation routes, staging area, and helicopter landing area; evacuation plans in place; employees briefed on evacuation plans.

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July 11, 2019

Cory Wojtowicz
Land Approvals Team Lead
Regional Approvals
Environment and Parks
Box 540
Blairmore, AB T0K 0E0

Re: Reservation/ Activity Number CNT 860041 and CNT 980012
Coal Mining Application for Proposed Grassy Mountain Coal Project
Application No. 1844520 & 1902073 (formerly 1844522)
Location: TWP 8&9, RNG 3&4, W5M

Dear Cory Wojtowicz:

Benga Mining Ltd. (Benga), a wholly owned company of Riversdale Resources, filed an integrated application for the Grassy Mountain Coal Project (the Project) on August 15, 2016, and subsequently filed an amended *Public Lands Act* application in November 2017. As part of the requirements of the Public Lands application, Benga is providing this notification letter to request consent from the disposition holder associated with Consultative Notation (CNT) 860041 and CNT 980012.

As per the Conservation and Reclamation Plan, Benga is committed to returning the land to equivalent land use capability. End land use will vary spatially and temporally across the reclaimed Project area and will be focused on forestry, grazing, watershed protection, riparian, wetland and wildlife objectives.

The land and resource uses that occur in the proposed development area were assessed to identify how development of the proposed mine may impact those uses and to recommend mitigation measures to reduce impacts to either existing or potential land and resource uses.

To minimize the potential direct impacts of the proposed Project development on other land and resource users in the area, Benga will undertake the following:

- progressive reclamation, and reclaim the area to a landscape that includes provisions for a variety of land uses, including forestry, wildlife habitat, grazing, recreational use, etc.; and
- monitor changes in land use policies and initiatives and, through adaptive management, incorporate new requirements into the ongoing reclamation plans.

If you have any questions or would like to discuss this further, please contact Tyler Riewe, Senior Manager Safety, Health and Environment by email at <contact information removed> or by telephone at <contact information removed>

Regards,
<Original signed by>

Gary Houston
VP, External Affairs

RIVERSDALE
RESOURCES

July 11, 2019

Candace Piccin
Rangeland Approvals Team Lead
Regional Approvals
Environment and Parks
2nd fl Provincial Building
782 Main Street
Pincher Creek, AB T0K 1W0

Re: Reservation/ Activity Number PNT 090084 and PNT 090087
Coal Mining Application for Proposed Grassy Mountain Coal Project
Application No. 1844520 & 1902073 (formerly 1844522)
Location: TWP 8&9, RNG 3&4, W5M

Dear Candace Piccin:

Benga Mining Ltd. (Benga), a wholly owned company of Riversdale Resources, filed an integrated application for the Grassy Mountain Coal Project (the Project) on August 15, 2016, and subsequently filed an amended *Public Lands Act* application in November, 2017. As part of the requirements of the Public Lands application, Benga is providing this notification letter to illustrate that the Project is in alignment with the conditions of the Protective Notation (PNT) 090084 and PNT 090087.

As per PNT 090084 and PNT 090087, Benga will meet the requirements of Information Letter 2010-02 Foothills Fescue Grassland: Principles for Minimizing Surface Disturbance, which addresses obligations and specific direction regarding all potential surface disturbance-related activity in foothills rough fescue grassland plant communities. Since foothills rough fescue has been identified within rangelands located within the Project Footprint and is protected under a provincial PNT due to its known sensitivities to disturbance, Benga will prepare a Foothills Rough Fescue Mitigation Plan that will outline revegetation strategies designed to promote the re-establishment of foothills rough fescue. The plan is outlined in Attachment 1.

The preferred primary mitigation strategy for native rough fescue communities is avoidance, however; avoidance is not feasible for all areas of native rough fescue grasslands due to their location within the proposed open pit and rock disposal extents. In addition to avoidance (where possible), the following mitigation strategies will be implemented during Project activities:

- Minimize overall project disturbance.
- Native seeds will be collected to be used for future phased reclamation if the opportunity arises for their use in areas that are representative of pre-disturbance habitats.
- Identify potential areas on hill crests and southern aspects where native seed collected could be planted to establish native fescue grasslands.

Where direct disturbance is unavoidable, the following mitigation strategies will be implemented to preserve the resource:

- construct, or undertake assessments and surveys, during the dormant period for rough fescue (August to March); and
- avoid soil disturbance by:
    - minimizing topsoil stripping and grading outside of planned Project footprint;
    - utilizing existing trail footprints; and
    - potential implementation of seed collection and propagation plan and/or direct placement of sod.

Mitigation strategies will also include direct placement of reclamation material, collection of native seed from areas with foothills rough fescue and rare plants, seeding of wild harvest seed, as part of a certified, weed-free native seed mixes in re-vegetation plan, and the potential seeding and growing of plugs grown in a greenhouse to be transplanted onto the site.

Benga will also conduct re-vegetation monitoring that will include, but not be limited to, the following:

- Periodic assessment of the composition, structure, ecological succession and biodiversity of reclaimed vegetation; and
- Survival, growth and health assessments of re-vegetated areas to monitor the effectiveness of reclamation efforts relative to re-vegetation targets (including noxious and invasive species and effectiveness of control methods).

If you have any questions or would like to discuss this further, please contact Tyler Riewe, Senior Manager Safety, Health and Environment by email a<contact information removed> or by telephone at <contact information removed>

Regards,
<Original signed by>

Gary Houston
VP, External Affairs

Encl. Attachment 1

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Attachment 1

The following is an outline of the Foothills Rough Fescue Mitigation Plan, provided in the Project's Environmental Impact Assessment (EIA) (August 2016), and updated in response to Joint Review Panel IR-2.6, Appendix 2.6-1, Updated C&R Plan.

1.0 FOOTHILLS ROUGH FESCUE MITIGATION PLAN

The preferred primary mitigation strategy for native foothills rough fescue grasslands is avoidance. Vegetative disturbance within the project footprint is unavoidable, and therefore mitigation strategies will be implemented to improve the likelihood of re-establishing rangeland communities across the project throughout the life of the mine. The targeted distribution of grasslands in the reclaimed landscape is demonstrated in Table 1 and is shown in comparison to pre-disturbance landscapes.

Benga acknowledges that restoration of foothills rough fescue inhabited lands is relatively unproven but will rely on industry best practices and will utilize key findings from successful efforts made on other industrial disturbances in similar fescue grassland areas. A search of available literature, such as Lancaster *et al*. (2016), demonstrates several successes on similar landscapes, which will be incorporated into the reclamation plan as further defined below.

Vegetation assessments conducted across the mine have identified multiple fescue community types across the Project footprint. Foothills rough fescue dominant communities occupy 3.4 ha of pre-disturbance landscape, grassland communities where foothills rough fescue is a sub-dominant component occupy approximately 18.2 ha, and open forest grassland ecological units which have foothills rough fescue as a component of the ecological unit contain 36.3 ha, as identified in Table 1. The pre-disturbance foothills rough fescue communities exist in open valley bottoms, on south facing slopes, on ridges, and in patches in the Montane and Sub-Alpine Natural Subregions.

Table 1 demonstrates the distribution of foothills rough fescue dominant grasslands and grasslands with a foothills rough fescue component in the pre-disturbance landscape and the target distribution for the final reclaimed landscape. The foothills rough fescue dominant grasslands are expected to be disturbed early in the mine development from Year 1 through to Year 5. Foothills rough fescue seed will be collected prior to disturbance and annually through the five years as further discussed below. Avoidance measures will be exercised annually to allow seed collection from undisturbed portions of the foothills rough fescue dominated lands through to Year 5 when the lands surrounding the fescue-dominated areas are completely disturbed.

Table 1 Pre-disturbance and Proposed Post Reclamation Distribution of Foothills Rough Fescue

Foothills Rough Fescue Community	Pre-disturbance landscape		Reclaimed landscape	
	Area	% Area	Area	% Area
Foothills rough fescue dominant	3.4	0.2	4.0	0.3
Grasslands	18.2	1.2	276.7	18.2

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Table 1 Pre-disturbance and Proposed Post Reclamation Distribution of Foothills Rough Fescue				
Foothills Rough Fescue Community	Pre-disturbance landscape		Reclaimed landscape	
Open forest grasslands	36.3	2.4		
Total foothills rough fescue distribution	**57.9**	**3.8**	**280.7**	**18.5**

[1] Due to rounding of values, totals may not equal the sum of the individual values presented in the table.

Mitigation specific to the re-establishment of foothills rough fescue will include:

- direct reclamation material placement from grassland areas, when opportunities exist;
- collection of native foothills rough fescue seed from across the site;
- seeding of wild harvested certified weed-free native seed as a monocultures and as part of a certified, weed-free native seed mix;
- seeding and growing of foothills rough fescue plugs in a greenhouse for transplanting onto reclaimed areas of the site;
- occurrences of natural regeneration of native fescue; and
- promote the seeding of foothills rough fescue on the rough areas of the proposed golf course development to increase overall distribution of fescue grasslands.

The application of each of these methods is dependent on:

- the timing of the disturbance versus the availability of land ready to be reclaimed;
- availability and viability of certified weed free seed sources; and
- accessibility of ranges across the mine.

Direct placement of salvaged reclamation material will be prioritized, when opportunities exist, to promote foothills rough fescue and native grassland establishment. Specific opportunities to align the disturbance of the foothills rough fescue dominated communities with the availability of areas scheduled to be reclaimed will be pursued and considered before all other mitigation. Areas where direct placement is targeted will be further supported by other seeding and maintenance techniques to ensure soil stability and vegetation establishment of the desired communities is achieved.

As the growth of native foothills rough fescue grasslands may require a long period of time, the majority of early stage reclamation will use a certified, weed-free native seed mix that is representative of appropriate range type communities for the reclamation of natural upland herbaceous grasslands. Specifically, the *C5 Forest Management Plan 2006-2026* (Government of Alberta 2010) recommends that for reclamation work to adhere to the *Native Plant Revegetation Guidelines for Alberta – February 2001* (Native Plant Working Group 2000). These guidelines state that seed mixes, and the accompanying seed certificates of analysis, be submitted to appropriate AEP staff for approval prior to seed application. Benga has discussed the conceptual mixes with AEP and has been directed to confirm specific seed mixes prior to seeding.

Seeding of wild harvest collected native fescue seed is the preferred method for all reclaimed grassland ecological units. If the availability and collection of native fescue seed becomes limiting to re-vegetative efforts, seed sources will be supported with locally certified, weed-free native seed mixes.

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As the mine reaches maximum disturbance in Year 15, approximately 4.0 ha of reclaimed landscape will be selected to seed monocultures of foothills rough fescue as recommended by Sherritt (2012) in Lancaster, *et al*. (2016). Once seeded, monitoring programs will be implemented that will assess the success of foothills rough fescue establishment so that corrective actions can be recommended. The early development of rangeland communities will benefit from the remaining years of reclamation schedule and will utilize the adaptive management program to ensure that healthy rangeland communities are established. Following Year 15, additional landscape areas will be selected based on the results of the previously targeted foothills rough fescue dominated areas.

A portion of wild harvest collected fescue seed will be utilized to grow fescue plugs in local greenhouses. Tannas (2011) has documented that developing seedlings in an environmentally protected location, such as a greenhouse and transplanting to site, protects the seedlings from competition and environmental effects during their most vulnerable growth periods. Transplanting of plugs will target seeded areas of the reclaimed landscape where foothills rough fescue establishment has been limited, and these efforts will be coordinated with local recovery strategies. They are expected to be limited by the availability of local seed and local plugs, but will be utilized throughout the life of the mine ensure fescue communities establish and are maintained.

Reclaimed areas are also expected to benefit from a certain amount of natural regeneration of foothills rough fescue. These areas will be identified as part of the ongoing monitoring program for the mine. Areas where natural regeneration is identified will provide study opportunities to better understand the success parameters that can then feed into future efforts across the mine, elsewhere throughout the province, and throughout industry. Areas identified during monitoring where foothills rough fescue establishment is limited will be supplemented with a combination of overseeding, amending with hay cuttings/mulch harvested from the foothills rough fescue being collected, and transplanting of plugs as required.

Well-designed monitoring programs are very important during the first five years following construction and reclamation, and long term monitoring programs are recommended for disturbance and reclamation of rough fescue grasslands (AESRD 2011). In addition to monitoring of the establishment in the first few years of reclamation, range health assessment of natural upland herbaceous grasslands would be conducted at Year 5 and Year 10 once each reclamation phase has been completed. Additional annual range health assessments would be conducted after Year 10 should the results of the range health assessments indicate that the range health functions of the community are not being restored.

References

Alberta Environment and Sustainable Resource Development (AESRD). 2011. Range Health Assessment Field Worksheet for Grasslands. Available online at: http://esrd.alberta.ca/lands-forests/grazing-range-management/range-health.aspx.

Government of Alberta. 2010. C5 Forest Management Plan 2006-2026. Prepared for: Alberta Sustainable Resource Development, Forest Protection Branch, by Wildland Disturbance Consulting. Available online at: http://aep.alberta.ca/lands-forests/forest-management/forest-management-plans/forest-management-unit-c5.aspx. Accessed August 2015.

Lancaster, J., R. Adams, B. Adams and P. Desserud. 2016. Long-term Revegetation Success of Industry Reclamation Techniques for Native Grasslands: Foothills Fescue, Foothills Parkland and Montane Natural Subregions; Phase 1-Literature Review and Case Studies-2014. Prepared for: Land and Forestry Policy Branch, Alberta Environment and Sustainable Resource Development.

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Native Plant Working Group. 2000. Native Plant Revegetation Guidelines for Alberta. H. Sinton-Gerling (ed.). Alberta Agriculture, Food and Rural Development and Alberta Environment. Edmonton, AB. 67 pp.

Sherritt, D.E. 2012. Festuca hallii (vasey), Piper (plains rough fescue) and Festuca campestris Rybd (Foothills rough fescue) Responses to Seed Mix Diversity and Mycorrhizae. University of Alberta, Edmonton, Ab. 84 pp.

Tannas, S. 2011. Mechanisms Regulating Poa pratensisL and Festuca campestris Rybd. Within the Foothills Fescue Grasslands of Southern Alberta. Dissertation. University of Alberta, Edmonton, Ab. 362 pp.

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RIVERSDALE
RESOURCES

July 11, 2019

Candace Piccin
Rangeland Approvals Team Lead
Regional Approvals
Environment and Parks
2nd fl Provincial Building
782 Main Street
Pincher Creek, AB T0K 1W0

Re: Reservation/ Activity Number PNT 880617 to PNT 880619 and PNT 960092
Coal Mining Application for Proposed Grassy Mountain Coal Project
Application No. 1844520 & 1902073 (formerly 1844522)
Location: TWP 8&9, RNG 3&4, W5M

Dear Candace Piccin:

Benga Mining Ltd. (Benga), a wholly owned company of Riversdale Resources, filed an integrated application for the Grassy Mountain Coal Project (the Project) on August 15, 2016, and subsequently filed an amended *Public Lands Act* application in November 2017. As part of the requirements of the Public Lands application, Benga is providing this notification letter to illustrate that the Project is in alignment with the conditions of the Protective Notation (PNT) 880617 to PNT 880619 and PNT 960092.

To mitigate the concern associated with potential instability, Benga has developed mine design criteria based on the results of the geotechnical investigation and geological modelling. As per the Conservation and Reclamation Plan, Benga is committed to returning the land to equivalent land use capability. End land use will vary spatially and temporally across the reclaimed Project area and will be focused on grazing, forestry, watershed protection, riparian, wetland and wildlife objectives.

The land and resource uses that occur in the proposed development area were assessed to identify how development of the proposed mine may impact those uses and to recommend mitigation measures to reduce impacts to either existing or potential land and resource uses.

To minimize the potential direct impacts of the proposed Project development on other land and resource users in the area, Benga will undertake the following:

- progressive reclamation, and reclaim the area to a landscape that includes provisions for a variety of land uses, including forestry, wildlife habitat, grazing, recreational use, etc.; and
- monitor changes in land use policies and initiatives and, through adaptive management, incorporate new requirements into the ongoing reclamation plans.

If you have any questions or would like to discuss this further, please contact Tyler Riewe, Senior Manager Safety, Health and Environment by email at <contact information removed> or by telephone at <contact information removed>

Regards,

<Original signed by>

Gary Houston
VP, External Affairs

Encl. Attachment 1

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Attachment 1

Table 1 Reservations within the proposed disposition boundaries.				
Reservation/ Activity Number	Conflict	Mitigation/ Action Required	Disposition Holder	LSAS Requirement(s)
Mineral Surface Lease (Mining Area)				
PNT 880617	Steep rolling topography. No agricultural dispositions are permitted with the exception of unimproved grazing.	In order to mitigate the concern associated with potential instability, Benga has developed mine design criteria based on the results of the geotechnical investigation and geological modelling (Section B.8.6 of the EIA). A Conservation and Reclamation Plan has been developed for the Project (Section F of the EIA), which outlines measures that will be utilized to return the land to equivalent capability. For more information, please contact Tyler Riewe, Senior Manager Safety, Health and Environment by email at tyler.riewe@rivresources.com or by telephone at 403.753.8040.	Disposition held by the Lands Division of Department of Sustainable Resource Development – Pincher Creek Office – Rangeland District	0142: Steep Rolling Topography 3: No Agricultural Disposition 110: Unimproved Grazing
PNT 880618	Steep rolling topography. No agricultural dispositions are permitted.	In order to mitigate the concern associated with potential instability, Benga has developed mine design criteria based on the results of the geotechnical investigation and geological modelling (Section B.8.6 of the EIA). For more information, please contact Tyler Riewe, Senior Manager Safety, Health and Environment by email at tyler.riewe@rivresources.com or by telephone at 403.753.8040.	Disposition held by the Lands Division of Department of Sustainable Resource Development – Pincher Creek Office – Rangeland District	0142: Steep Rolling Topography 3: No Agricultural Disposition
PNT 880619	Steep rolling topography. No agricultural dispositions are permitted with the exception of unimproved grazing.	A Conservation and Reclamation Plan has been developed for the Project (Section F of the EIA), which outlines measures that will be utilized to return the land to equivalent capability. For more information, please contact Tyler Riewe, Senior Manager Safety, Health and	Disposition held by the Lands Division of Department of Sustainable Resource Development – Pincher Creek Office –	0142: Steep Rolling Topography 3: No Agricultural Disposition 110: Unimproved Grazing

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Table 1 Reservations within the proposed disposition boundaries.

Reservation/ Activity Number	Conflict	Mitigation/ Action Required	Disposition Holder	LSAS Requirement(s)
		Environment by email at tyler.riewe@rivresources.com or by telephone at 403.753.8040.	Rangeland District	
PNT 960092	Steep rolling topography. No agricultural dispositions are permitted with the exception of "Grazing Haying" - These lands best suited for grazing due to steep slopes ranging from 15% to >30%. Prime waterhsed protection along gold creek and fish habitat; potentially valuable for ungulate habitat and potential for reforestation under a multiple use plan.	In order to mitigate the concern associated with potential instability, Benga has developed mine design criteria based on the results of the geotechnical investigation and geological modelling (Section B.8.6 of the EIA). A Conservation and Reclamation Plan has been developed for the Project (Section F of the EIA), which outlines measures that will be utilized to return the land to equivalent capability. For more information, please contact Tyler Riewe, Senior Manager Safety, Health and Environment by email at tyler.riewe@rivresources.com or by telephone at 403.753.8040.	Disposition held by the Department of Sustainable Resource Development – Pincher Creek Office – Rangeland District	0142: Steep Rolling Topography 3: No Agricultural Disposition 100: Grazing Haying

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RIVERSDALE
RESOURCES

July 11, 2019

David Hunt
Water Approvals Team Lead
Regional Approvals
Environment and Parks
2nd Floor Provincial Building
200 – 5 Avenue South
Lethbridge, AB T1J 4L1

Re: Reservation/ Activity Number PNT 900430
Coal Mining Application for Proposed Grassy Mountain Coal Project
Application No. 1844520 & 1902073 (formerly 1844522)
Location: TWP 8&9, RNG 3&4, W5M

Dear David Hunt:

Benga Mining Ltd. (Benga), a wholly owned company of Riversdale Resources, filed an integrated application for the Grassy Mountain Coal Project (the Project) on August 15, 2016, and subsequently filed an amended *Public Lands Act* application in November 2017. As part of the requirements of the Public Lands application, Benga is providing this notification letter to illustrate that the Project is in alignment with the conditions of the Protective Notation (PNT) 900430.

As per the Conservation and Reclamation Plan, Benga is committed to returning the land to equivalent land use capability. End land use will vary spatially and temporally across the reclaimed Project area and will be focused on grazing, forestry, watershed protection, riparian, wetland and wildlife objectives.

The land and resource uses that occur in the proposed development area were assessed to identify how development of the proposed mine may impact those uses and to recommend mitigation measures to reduce impacts to either existing or potential land and resource uses.

To minimize the potential direct impacts of the proposed Project development on other land and resource users in the area, Benga will undertake the following:

- progressive reclamation, and reclaim the area to a landscape that includes provisions for a variety of land uses, including forestry, wildlife habitat, grazing, recreational use, etc.; and
- monitor changes in land use policies and initiatives and, through adaptive management, incorporate new requirements into the ongoing reclamation plans.

If you have any questions or would like to discuss this further, please contact Tyler Riewe, Senior Manager Safety, Health and Environment by email at <contact information removed> or by telephone at <contact information removed>

Regards,
<Original signed by>

Gary Houston
VP, External Affairs

RIVERSDALE
RESOURCES

July 11, 2019

Candace Piccin
Rangeland Approvals Team Lead
Regional Approvals
Environment and Parks
2nd Floor Provincial Building
782 Main Street
Pincher Creek, AB T0K 1W0

Re: Reservation/ Activity Number PNT 930299 and PNT 940130
Coal Mining Application for Proposed Grassy Mountain Coal Project
Application No. 1844520 & 1902073 (formerly 1844522)
Location: TWP 8&9, RNG 3&4, W5M

Dear Candace Piccin:

Benga Mining Ltd. (Benga), a wholly owned company of Riversdale Resources, filed an integrated application for the Grassy Mountain Coal Project (the Project) on August 15, 2016, and subsequently filed an amended *Public Lands Act* application in November, 2017. As part of the requirements of the Public Lands application, Benga is providing this notification letter to illustrate that the Project is in alignment with the conditions of the Protective Notation (PNT) 930299 and PNT 940130.

As per PNT 930299 and PNT 940130, Benga has met the requirements under Section 21 of the *Forest Reserves Regulation*. Benga has been engaged in frequent and productive discussions with holders of grazing leases throughout Project development. Benga is committed to continued engagement with grazing lease holders as the Project continues to develop to ensure that any issues that may arise are resolved in a mutually agreeable manner. Benga is committed to meeting with the grazing lease holders to ensure a continued line of communication with these stakeholders. Grazing lease holders are also included on Benga's email distribution list for Project updates, notices, and newsletters. Public engagement has been outlined in Section G of the Environmental Impact Assessment (August 2016).

As per the Conservation and Reclamation Plan, Benga is committed to returning the land to equivalent land use capability. End land use will vary spatially and temporally across the reclaimed Project area and will be focused on grazing, forestry, watershed protection, riparian, wetland and wildlife objectives.

The land and resource uses that occur in the proposed development area were assessed to identify how development of the proposed mine may impact those uses and to recommend mitigation measures to reduce impacts to either existing or potential land and resource uses.

To minimize the potential direct impacts of the proposed Project development on other land and resource users in the area, Benga will undertake the following:

- progressive reclamation, and reclaim the area to a landscape that includes provisions for a variety of land uses, including forestry, wildlife habitat, grazing, recreational use, etc.; and

- monitor changes in land use policies and initiatives and, through adaptive management, incorporate new requirements into the ongoing reclamation plans.

If you have any questions or would like to discuss this further, please contact Tyler Riewe, Senior Manager Safety, Health and Environment by email at <contact information removed> or by telephone at <contact information removed>

Regards,

<Original signed by>

Gary Houston
VP, External Affairs

PO Box 660 | 12331 20th Avenue | Blairmore, AB T0K 0E0 403 753 5160 rivresources.com

GRASSY MOUNTAIN PROJECT
MEETING NOTES

Date/Time Field	17/05/16 11:00 am
Location	Benga Mining Office
Community	Blairmore, Alberta
Community Attendees:	Terry and Kevin Michalsky
Project Attendees:	Cal Clark and Keith Bott
Purpose of Meeting:	To discuss Benga Mining's proposed MSL and the impact it will have on Michalsky's Trap line
Materials Provided or Exchanged:	

Follow-up Required? ☐ Yes ☐ No

PERSON RESPONSIBLE	TASK	DUE DATE

Meeting Discussion

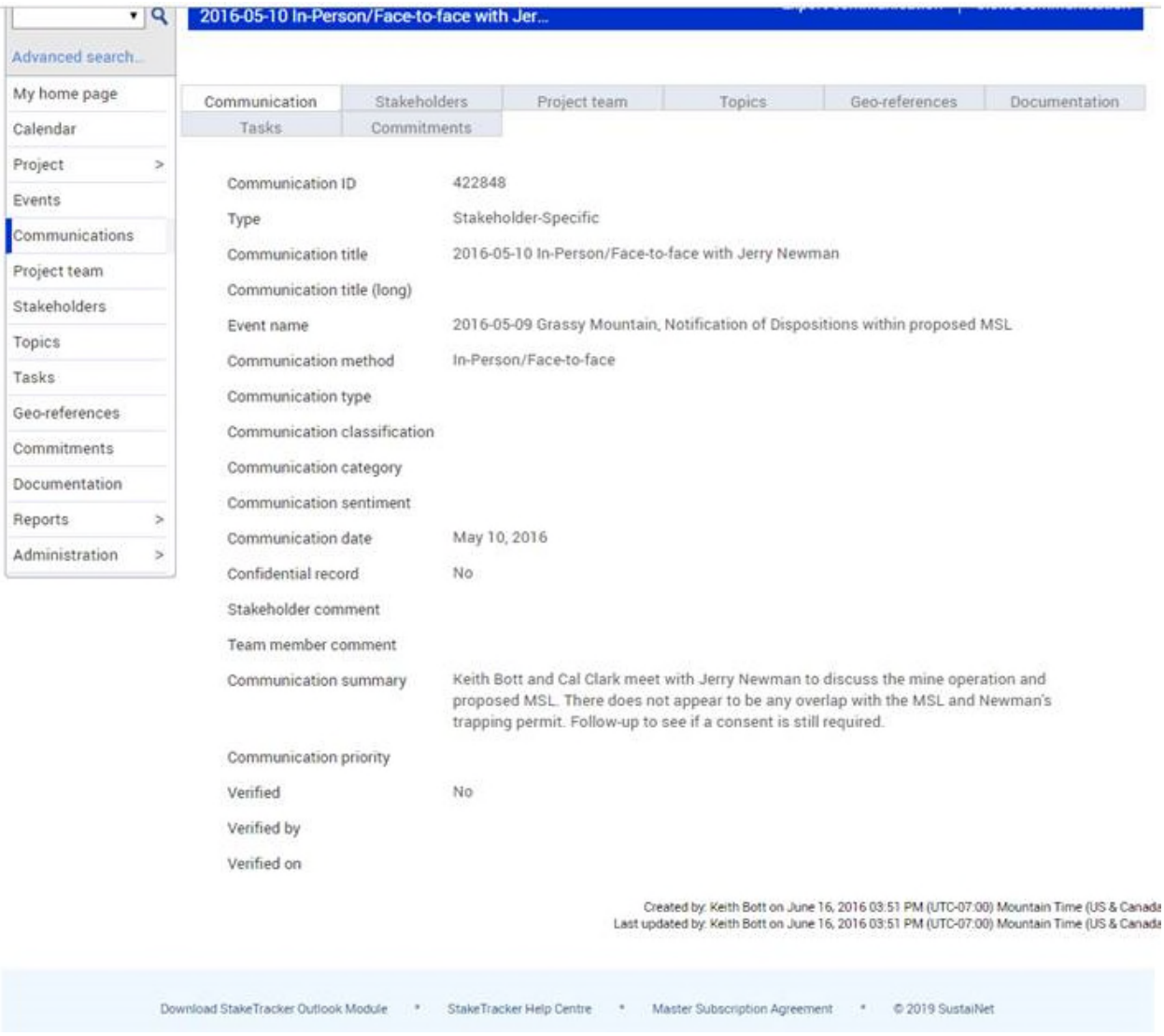
Cal Clark gave an overview of the project, time lines and proposed MSL. We compared it to the trapping permit that Michalsky holds. The MLS overlaps with their permit, but they did not indicate that this was key trapping area. Their main concern was access to their trapper's cabin from the south. I advised I would prepare a consent for that we could sign into and would include and access agreement into the consent. Items prepared and forwarded to him via email for his review.

Issues

Access from the south.

Prepared by: Keith Bott

Reviewed & Approved by: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Documentation
Tasks
Commitments
Communication ID 422848
Type Stakeholder-Specific
Communication title 2016-05-10 In-Person/Face-to-face with Jerry Newman
Communication title (long)
Event name 2016-05-09 Grassy Mountain, Notification of Dispositions within proposed MSL
Communication method In-Person/Face-to-face
Communication type
Communication classification
Communication category
Communication sentiment
Communication date May 10, 2016
Confidential record No
Stakeholder comment
Team member comment
Communication summary Keith Bott and Cal Clark meet with Jerry Newman to discuss the mine operation and proposed MSL. There does not appear to be any overlap with the MSL and Newman's trapping permit. Follow-up to see if a consent is still required.
Communication priority
Verified No
Verified by
Verified on
Created by: Keith Bott on June 16, 2016 03:51 PM (UTC-07:00) Mountain Time (US & Canada
Last updated by: Keith Bott on June 16, 2016 03:51 PM (UTC-07:00) Mountain Time (US & Canada
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Communication:
2016-06-02 Email, Newman, Request for an...

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Communication ID	422502
Type	Stakeholder-Specific
Communication title	2016-06-02 Email, Newman, Request for another meeting
Communication title (long)	
Event name	2016-05-09 Grassy Mountain, Notification of Dispositions within proposed MSL
Communication method	Email with attachment
Communication type	
Communication classification	Interests
Communication category	
Communication sentiment	
Communication date	June 02, 2016
Confidential record	No
Stakeholder comment	
Team member comment	
Communication summary	Keith Bott sneds email to Jerry Newman. Initial meeting indicated that his trap line did not overlap with proposed MSL, but upon further reveiw it appears it does slightly. Email sent with a draft of consent and requirement to meet again.
Communication priority	
Verified	No
Verified by	
Verified on	