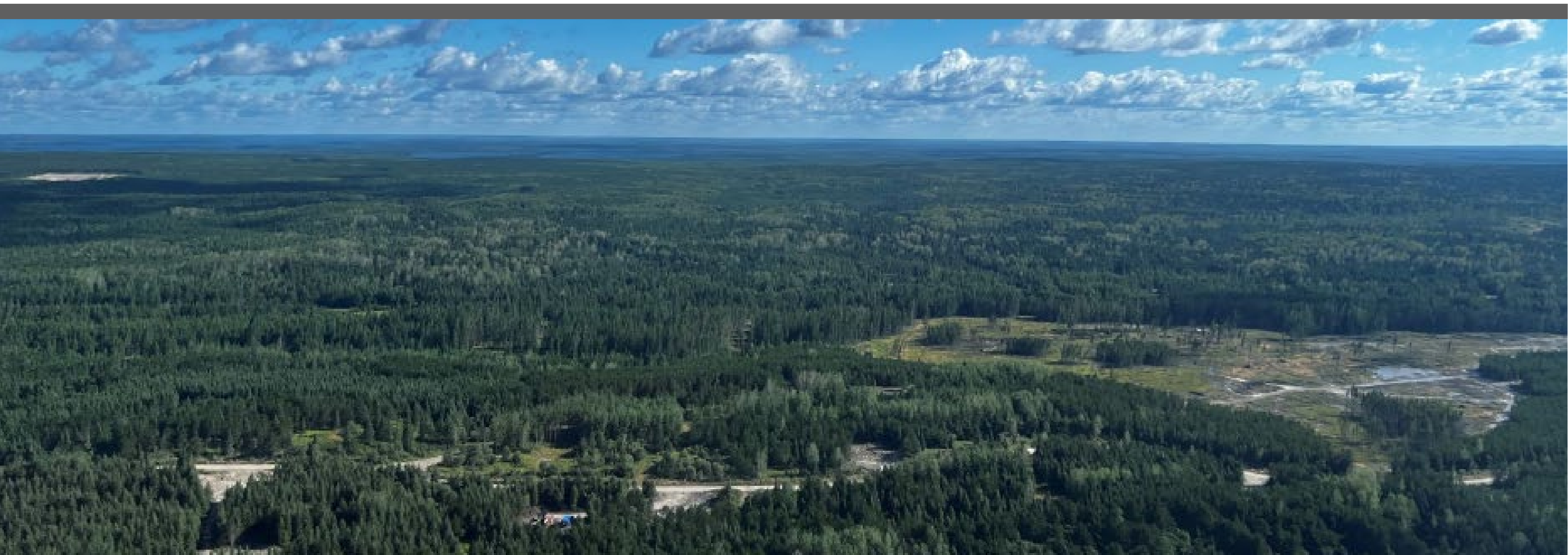
Great Bear Gold Project
Impact Statement

Appendix W-4:

Climate Risk and Resilience Assessment



GREAT BEAR RESOURCES

GREAT BEAR PROJECT

CLIMATE RISK AND RESILIENCE ASSESSMENT

AUGUST 2025

FINAL

GREAT BEAR PROJECT IMPACT STATEMENT

CLIMATE RISK AND RESILIENCE ASSESSMENT

GREAT BEAR RESOURCES

FINAL

PROJECT NO.: OMEMA 2023
AUGUST 2025

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1 INTRODUCTION

This Climate Risk and Resilience Assessment has been prepared by WSP Canada Inc. (WSP) to estimate climate change associated risks for the proposed Great Bear Gold Project (the Project) and identify how potential risks are expected to be managed through treatment / adaptation measures to demonstrate the climate resilience of the Project throughout its lifetime.

1.1 REPORT OVERVIEW

Canada's climate is warming at a rate about twice that of the global average (Bush and Lemmen 2019). Ontario is experiencing similar increasing trends that are projected to continue in the future, including changes in the frequency and magnitude of extreme weather events (Douglas and Pearson 2022). As these changes impact the surrounding environment, they will also very likely impact the Project. This report has been prepared to identify and understand the potential ways climate may interact with the Project, as well as outline how these potential impacts are being considered in the Project design, and the operation, maintenance and closure of the Project. These considerations are called climate treatment or adaptation measures and are used to manage climate-related impacts or risks over the Project lifetime.

This report provides the climate change risk assessment (CCRA) of the Project and is developed in line with well know climate risk frameworks such as the Mining Association of Canada (MAC) *A Guide on Incorporating Climate Change Adaptation into Decision Making for the Mining Sector* (MAC 2021) and the Draft Technical Guide Relating to the Strategic Assessment on Climate Change (SACC): Assessing Climate Change Resilience (ECCC 2022). A more detailed discussion of the assessment objectives and how they relate to these frameworks is available in Section 1.2, below. These frameworks follow a stepwise process to identify and understand the potential risks associated with a project. The first step is to understand which aspects of a project may interact with climate and then assess the risk associated with the interactions by looking at the likelihood the interaction could occur given the design of the project and the consequence of the impact. Based on the risks identified, treatment or adaptation measures can be identified to manage these risks over time, as mentioned above. Looking at how the treatment and adaptation measures help to address projected changes in climate supports the evaluation of whether a project could be considered resilient in the face of a changing climate.

This report outlines how the Project has been integrating future climate considerations throughout the planning phase and will continue to consider climate change throughout each phase of the project by following available guidance for the mining sector and relevant regulatory requirements, and by leveraging risk management and adaptation processes already planned for the Project. While climate risk will likely always be present for any major project in Canada, climate-informed design and decision making (e.g., treatment and adaptation measures) support resilient project operation in the face of a changing climate. This report demonstrates how the Project can operate resiliently throughout all phases of the project.

1.2 REGULATORY OBJECTIVE

This CCRA has been prepared to support the Impact Statement for the Project and focuses on physical climate change risk and resilience of the Project. Climate change resilience is defined as:

> *The ability of a system (built, natural, social or economic) to anticipate, withstand, recover, adapt to and transform in response to a climate-related hazards* (ECCC 2022).

The objectives of this CCRA included:

- Establishing the relevance of the Project and interaction with climate change. This included identifying key infrastructure and operations and considering this infrastructure in the operation and post-closure phases of the Project.

- Identifying the relevant climate hazards that may interact with the Project infrastructure and operations and establishing the likelihood of these interactions using climate change projections. The Detailed Climate Change Dataset Report (WSP 2024) prepared for the Project was used in this CCRA.
- Complete a physical risk analysis and evaluation using the consequence of a given climate hazard interaction, and the likelihood of the interaction to occur based on the current Project description, understanding this assessment has been completed ahead of the finalized design of the Project.
- Identifying proposed risk treatment and adaptation measures of how climate change risks will manage through design, operation and post-closure to demonstrate climate resilience of the Project.

This CCRA aligns with the Draft Technical Guide Relating to the Strategic Assessment on Climate Change (SACC): Assessing Climate Change Resilience (ECCC 2022), which provides a technical guidance for how proponents pursing a project under a federal impact assessment can consider the resilience of their project. In addition to the SACC, the CCRA has been prepared in consideration with the Mining Association of Canada (MAC) *A Guide on Incorporating Climate Change Adaptation into Decision Making for the Mining Sector* (MAC 2021). That document provides a stepwise approach that mining facilities such as the Project may apply to incorporate climate change adaptation into decision-making and to increase climate resilience.

Table 1 provides a roadmap of the report sections and identifies how they coincide with each of the steps outlined in the SACC's (2022) climate risk framework.

Table 1: Report Roadmap and SACC Alignment

SACC (2022) Risk Framework Step	CCRA Report Section
Step 1: Establishing the Project Context	Section 1.2: Project Context
Step 2: Identifying Climate Hazards	Section 3.1: Climate Hazards and Project Components
Step 3: Risk Analysis Step 4: Risk Evaluation	Section 3.2: Risk Analysis and Evaluation
Step 5: Risk Treatment and Adaptation Measures	Section 3.3: Risk Treatment and Adaptation Measures
Statement on the Projects Resilience to Climate Change	Section 4: Climate Change Resilience

1.3 PROJECT CONTEXT

A brief description of the Project stage schedule and infrastructure / processes is provided below aligning with the requirements outlined in Step 1 of the SACC (2022).

Great Bear Resources Ltd. (Great Bear Resources) a wholly owned subsidiary of Kinross Gold Corporation, is proposing to develop a gold mine at the Great Bear Property. The Property is located approximately 25 kilometres (km) southeast of the Municipality of Red Lake in northwestern Ontario. The purpose of the Project is to produce gold doré bars on site, by constructing and operating an underground and open pit mine, process plant and associated facilities. A breakdown of the Project infrastructure components at each life stage is presented in Section 3.1.1.

The Project includes the potential development / construction, operation, and decommissioning and closure of an underground and open pit gold mine. The Project schedule has been established based on current knowledge. The Project phases are planned as follows:

- Construction phase: Year -3 to Year -1, 3 years in length
- Operations phase: Year 1 to Year 26, 26 years in length

- Decommissioning and closure (closure) phase:
  - Active closure period: Year 27 to Year 29, 3 years in length
  - Passive closure period: Year 30 plus (one to a few years expected)
  - Final closure period (removal of water management infrastructure): Less than one year in length after regulatory approval for passive discharge received.

Following the current proposed schedule, the operations phase of the Project will begin in 2030 and carry through to 2055. Active closure is expected to last three years from 2056 to 2058, to be followed by a passive closure period of site management while the mine workings of filling with water and a final closure period when water management infrastructure is decommissioned. These closure-related activities and monitoring will extend past 2060. After final closure, there may be an additional period of environmental monitoring.

This CCRA considers two future time horizons, the 2050's (2041 to 2070) and the 2080's (2071 to 2100) as these time horizons will be representative of the operations and post-closure activities. Further details on the CCRA future time horizons and climate projection analysis are presented in Section 2.2.

2 APPROACH AND METHODOLOGY

This section outlines the approach and methodology used for this CCRA to achieve the objectives presented in Section 1.1. To assess the potential climate change risk for the Project, the following tasks were completed:

- **Climate Hazards and Components:** Identified relevant climate hazards and Project's infrastructure components and identify the interactions between them (known as interactions).
- **Risk Assessment**: Completed a risk analysis through assessing likelihood and consequence to develop a risk score for each relevant interaction. This risk analysis is completed for the current Project description with the understanding that the design will be finalized in the future.
- **Treatment and Adaptation Measure:** Assessed how climate change risk has already been considered in the current Project description or will be addressed through treatment and adaptation measures to assess potential resilience to climate change.

Figure 1 outlines the assessment approach taken to evaluate the Project's resilience to future climate conditions.

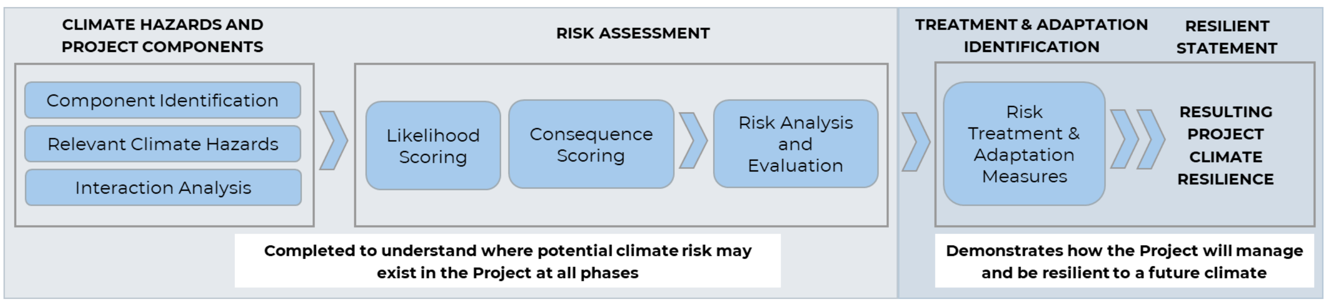

Figure 1: Assessment Approach

A detailed description of the approach and methodology for each step are described in this section.

2.1 INTRODUCTION TO CLIMATE CHANGE

An important step in the risk assessment process is identifying climate hazards and gathering climate change projections to assess potential risk. A site-specific climate change dataset was prepared (WSP 2024) for the Project to estimate both current and future projected climatic conditions. To understand the climate projection methodology, and how climate change is considered in this assessment, a brief introduction to climate change can be useful. More information on the technical approach of how the climate dataset was developed is available in WSP (2024).

The Intergovernmental Panel on Climate Change (IPCC) is generally considered to be the definitive source of information related to past and future climate change as well as climate science. The IPCC is a United Nations body dedicated to providing an objective, scientific assessment of climate change information, and the potential natural, political, economic, and human impacts of climate change. The IPCC periodically releases Assessment Reports, each of which provides the current state of climate change science, where there is agreement within the scientific community. The *Fifth Assessment Report (AR5)* was released in 2013 (IPCC 2013), and the *Sixth Assessment Report (AR6)* was released in 2021 (IPCC 2021). AR6 represents the most current complete synthesis of information regarding climate change. Hence, the future climate projections described in this section are based on AR6 data.

When projecting future climate conditions, there needs to be consideration of future climate scenarios which is based on assumptions about future GHG emissions and atmospheric concentrations. In AR6, these scenarios, are called Shared Socioeconomic Pathways (SSPs), and are summarized in Table 2.

Table 2: Characterization of Shared Socioeconomic Pathways in IPCC Sixth Assessment Report

SSP	Radiative Forcing in 2100	Challenges	Global Temperature Change	Characterization
SSP1	1.9 W/m^2 2.6 W/m^2	Sustainability – Low for mitigation and adaptation	1.0°C to 2.4°C	Sustainable development proceeds at a reasonably high pace.
SSP2	4.5 W/m^2	Middle of the Road – Medium for mitigation and adaptation	2.1°C to 3.5°C	An intermediate case between SSP1 and SSP3. Analogous to RCP 4.5 scenario.
SSP3	7.0 W/m^2	Regional Rivalry – High for mitigation and adaptation	2.8°C to 4.6°C	Unmitigated emissions are high due to moderate economic growth.
SSP4	3.4 W/m^2 6.0 W/m^2	Inequality – High for adaptation, low for mitigation	—	A mixed world, with relatively rapid technological development in low carbon energy sources in key emitting regions, leading to relatively large mitigative capacity in places where it mattered most to global emissions.
SSP5	8.5 W/m^2	Fossil-fuelled Development – Low for mitigation, high for adaptation	3.3 to 5.7°C	In the absence of climate policies, energy demand is high and most of this demand is met with carbon-based fuels. Analogous to RCP 8.5 scenario.

Note:
W/m^2: watts per metre squared

These scenarios represent the uncertainty in human contribution to climate change from now to the end of century.

2.2 CLIMATE HAZARD AND PROJECT COMPONENTS

The initial step, and to align with Step 2 of the SACC (2022), the assessment identified relevant Project infrastructure components that could be impacted by climate hazards. Project infrastructure components were identified and categorized into infrastructure categories by reviewing Project documentation. Only Project infrastructure components in the operations and post-closure phases of the Project were considered in this assessment (Table 3) and detailed in Table 8 and Table 9.

The construction phase, and decommissioning / closure phase were not considered in this assessment as they are only expected to extend from 2027 to 2029 and 2056 to the early 2060's, respectively. Any climate hazard variation in these timeframes would be within interannual variation rather than long-term variation due to climate change.

Table 3: Project Infrastructure Assessed

Project Facility	Operations Phase Condition	Post-closure Condition
Underground mine	Underground operating over the entire life of mine, extracting and bringing rock to surface by ramp or shaft	Water filled mine workings, sealed at surface
LP Central pit	Open pit mine operating for the first about 9 years of operations, bring rock to surface by ramp	Water filled open pit (pit lake) passively overflowing to Dixie Creek
Surface stockpiles: low grade ore stockpile, run of mine ore stockpile, overburden stockpile and mine rock stockpile	Actively storing rock (ore and mine rock) and overburden extracted from the mine Ore stockpiles depleted over the life of mine as removed for processing Progressive reclamation (shaping and revegetation) of the mine rock stockpile later in mine life	Revegetated stockpile areas (ore) or stockpiles (overburden and mine rock)
Ore process plant	Actively processing ore from stockpiles	Revegetated process plant area
Facilities to manage tailings from the processing of ore: tailings management facility (TMF) and Viggo management facility (VMF)	TMF to receive thickened desulphurized tailings with surrounding dams raised as needed using aggregate to increase tailings storage capacity VMF receiving concentrate tailings stored under water	Revegetated tailings surface contained by natural topography and permeable rock dams Isolated flooded facility having a stable water level below the ground surface
Water management and treatment works	Collection and treatment of contact waters in sumps, ditches and ponds for treatment to meet regulatory standards, with excess treated water discharged through a pipeline to the Chukuni River	Reshaped and revegetated landscape, with passive runoff by gravity only
Onsite quarries and sand and gravel pits	Active extraction of rock, and sand and gravel for use in site operations as needed	Reshaped and revegetated landscape
Other onsite buildings, facilities, areas and infrastructure.	Active use of buildings and infrastructure to support mining and processing operations	Reshaped and revegetated landscape

Project Facility	Operations Phase Condition	Post-closure Condition
Fish compensation areas: diversion dam and pond along Watercourse 3B, reconstruction of Waterbody 6B, diversion channel connecting the diversion pond and Dixie Creek Pond complex.	Constructed fish habitat that is actively monitored for effectiveness.	Present at the site but not actively managed or monitored.

Following the identification of Project's infrastructure components, climate hazards that could impact the infrastructure were selected. This was done by considering what climate hazards may be applicable to the Project region, and what physical characteristics of the Project could be impacted by climate. The following climate hazards were identified:

- Temperature-related: temperature increase, extreme heat, evapotranspiration, drought, extended cold spells and freeze-thaw cycles
- Precipitation-related: precipitation increase, extreme precipitation, flooding and snowfall
- Extreme events: freezing rain, high winds and wildfires.

For each climate hazard identified, climate indicators were selected to represent how the climate hazard may change over time. Climate indicators are selected as proxy variables to the climate hazard and relate to the most probable climate condition that would result in a potential interaction occurring. As noted in *Canada in a Changing Climate Synthesis Report* (Lulham et. al. 2023), confidence levels associated with different climate hazard projections vary. This is due to the confidence in the climate models themselves, for any given climate hazard. Using the confidence scale provided by Lulham et. al. (2023), climate hazards assessed in this CCRA were qualitatively assigned a confidence rating, as shown in Table 4. For the purposes of this assessment, confidence levels should be considered informational only and be assessed in more detail as the project progresses. This confidence rating scale is based on Canada wide trends and aligns with the IPCC.

Table 4: Confidence Scale

Confidence/likelihood not assessed for this finding	Low Confidence	Medium Confidence	Likely / High Confidence	Very Likely / Very High Confidence	Virtually Certain	Fact

Following the identification of climate hazards and Project infrastructure, interactions between the two were identified. Where a potential interaction was identified the interaction was carried forward into the risk analysis. Notably, the interactions identified are related to physical risk rather than potential opportunities. Although it is acknowledged that potential opportunities due to climate change may exist, they were not the focus of this assessment as the purpose of this CCRA is to identify the potential climate risks to the project. A preliminary, non-exhaustive list of potential climate change opportunities has been included that can be built on as the Project moves forward.

2.3 RISK ANALYSIS AND EVALUATION METHODOLOGY

This section outlines the approach and methodology taken to complete the risk analysis and evaluation. Specifically, this section outlines:

- The likelihood scales and how the likelihood scores were developed.
- The consequence scales and how the consequence scores were developed.
- The risk matrix and impact ratings definitions.

The risk analysis and evaluation approach for this CCRA was developed in alignment with Great Bear's risk analysis scales and ratings that were provided for consistency.

2.3.1 LIKELIHOOD SCORING

Likelihood was used to describe the frequency at which an interaction may occur between climate hazards and the Project's infrastructure. A likelihood scale was used to define categories that describe this frequency and is provided in Table 5: For each climate hazard, a related climate indicator was used to estimate the likelihood of an interaction. An example of a climate indicator could be average annual total precipitation, used to describe increasing precipitation as a climate hazard.

Table 5: Climate Risk Likelihood Scale

Likelihood	Score	Description
Almost Certain / Frequent	A (5)	Climate – infrastructure interaction is almost certain to happen.
Likely	B (4)	Climate – infrastructure interaction is likely to occur. Climate – infrastructure interaction occurs once every 2 years
Possible	C (3)	Climate – infrastructure interaction is possible. Climate – infrastructure interaction occurs once every 10 years
Unlikely	D (2)	Climate – infrastructure interaction is unlikely to occur, but it may happen unexpectedly. Climate – infrastructure interaction occurs once every 100 years
Rare	E (1)	It is almost certain that the climate – infrastructure interaction will not happen, but it may occur in rare or exceptional circumstances. Climate – infrastructure interaction outcome occurs once every 500 years

The WSP (2024) detailed climate change dataset was used to estimate frequency of future climate event interactions and formed the basis of the likelihood scores for this assessment. A multi-model ensemble of future climate projections was extracted from ClimateData.ca to derive climate indicators, which is used to estimate likelihood for each interaction. The multi-model ensemble considers low (SSP1-2.6), moderate (SSP2-4.5), and high (SSP5-8.5) emissions scenarios, consisting of future climate projections for a total of 26 climate models, each representing a potential future climate for each emissions scenario (total of 78 potential future climates). By taking this approach, uncertainty in the climate models can be considered as variation in future climate projections is captured across three future emission scenarios. Climate indicators were derived for three periods to represent:

- Current (1991 to 2020).
- Mid-century (2041 to 2070).
- Late-century (2071 to 2100).

The modelled current period was chosen to represent the most recent World Meteorological Organization (WMO) climate normal period to base projected changes in climate from this period to the mid-century and late-century future periods. These future time periods are also consistent with the life stages of the Project. Each period was set at a length of 30 years to represent climatic conditions at a given point in time, while reducing the influence of climate oscillations that occur on interannual timescales including El-Niño Southern Oscillation (ENSO) and Pacific Decadal Oscillation (PDO) (WMO 2017).

The likelihood of Project interactions was estimated by fitting appropriate statistical distributions to a set of climate indicators, which are used to represent the occurrence of climate hazards under current and future climate. The statistical distribution was then mapped and aligned with the internal likelihood scale provided by Great Bear Resources and is outlined in Table 5. Using the descriptions provided for each likelihood level, a recurrence period was mapped to each of the five categories to provide a quantitative estimate of how often the event would occur. This was done to understand the climate signals (probability of change) associated with the different reoccurrence periods, across the time horizons within the modelled data.

Following this stepwise approach, likelihoods were qualitatively assigned to assume lower likelihood in current climate, under the assumption that the Project will be designed to current climate conditions. This section aligns with the likelihood analysis requirements outlined in Step 3 of the SACC (2022).

2.3.2 CONSEQUENCE SCORING

Consequence scores were used to describe the expected impact of a given climate hazard interaction if it was to occur. That is, how impactful an interaction will be if it happens. Consequence impacts for each interaction were assessed across three main categories, which include dollar impact, licence to operate, and safety. Within these categories, six sub-categories are scored as described in Table 6. This consequence scale was adopted from the Great Bear Resources internal risk management frameworks.

For this CCRA, consequence scores were qualitatively scored across each of the six sub-categories for each identified climate hazard interaction. This was done by evaluating the interaction descriptions against the impact rating criteria in Table 6. Where available, external literature or other like projects were used as a reference in ranking impacts across the consequence sub-categories. As a conservative approach, the highest consequence score achieved for any given interaction was carried over into the risk analysis and evaluation assessment to understand the potential maximum probable risk. This section aligns with the consequence analysis requirements outlined in Step 3 of the SACC (2022).

Table 6: Consequence Scale

Impact Rating	Score	Impact of Climate – Infrastructure Interaction					
		Potential Dollar Impact		Licence to Operate Impact			Safety Impact
		Dollar Impact (revenue, cost, Project budget and value)	Project Schedule Delay	Indigenous Peoples and Stakeholder Relations and Reputation (Operations)	Indigenous Peoples and Stakeholder Relations and Reputation (Corporate)	Environment	Health and Safety
Extreme	5	> 20%	> 6 months	Vehement opposition and mine shutdown	Loss of confidence in the management of Company	Detrimental incident such as a tailings dam failure	Multiple deaths
Major	4	10 - 20%	3 - 6 months	Strong opposition and production interruptions	High impact on confidence in the management of Company	Major incident such as a leak or spill causing environmental damage	Death or severe injury of multiple employees
Moderate	3	5 - 10%	1 - 3 months	Moderate opposition and bad publicity	Medium impact on confidence in the management of Company	Minor incident resulting in a fine or written warning. Some remediation required	Severe Injury
Minor	2	1 - 5%	2 - 4 weeks	Some opposition	Limited impact on confidence in the management of the Company	Incident involving 3rd party supplier, off-site (e.g. consumables spill)	Minor Injury
Incidental	1	< 1%	< 2 weeks	Potential opposition	No impact on confidence in the management of the Company	Minor incident, no cleanup and no warning	Near Miss

2.3.3 RISK SCORING AND EVALUATION

Once the climate projections were gathered, the climate interactions were identified and likelihoods and consequences completed, potential future risks were calculated with out any future treatment or adaptation measures. This was completed to understand where climate change related risks exist, to better inform treatment and adaptation measure identification.

Risk ratings were assigned using the combination of the likelihood and consequence scoring using a scale from low risk to high risk, as described in Table 7, and as described in Step 4 of the SACC (2022). The risk rating matrix was developed to align with Great Bear Resources internal risk scale. Interactions that have low risk have either a low to moderate frequency, or a low to moderate severity, but cannot have a moderate to high frequency and severity. Interactions identified as having a medium or high-risk rating are projected to occur more frequently and have more severe impacts to a project. For example, extreme events (e.g., storms, extreme precipitation) have a lower probability of interacting with the Project infrastructure, however, the consequence of such an interaction may be more substantial rendering it a medium to high risk.

Notably, each risk level has been assigned with a designed nomenclature, which has been used to summarize and evaluate the risk results. For this CCRA, results have been summarized by main infrastructure / phase type as well as by climate hazard. High potential risk interactions would be the most impactful to the site. As such, high risks (H7 and above) were then the focus of the treatment and adaptation identification assessment, outlined in Section 3.3. However, Section 3.3 also provides treatment and adaptation measures across all identified risks.

Climate risks were also estimated in the current time period for Project-related infrastructure, to compare how climate risk may change over the lifetime of infrastructure and operations. By completing this comparison, the potential influence of a changing climate can be better understood on infrastructure. Current climate risk was not completed for any closure or post-closure infrastructure since closure infrastructure will not be in place during operations.

Table 7: Risk Rating Matrix

Risk Rating Matrix						
Likelihood Rating	5	L_{18}	M_{11}	H_6	H_3	H_1
	4	L_{20}	M_{14}	M_{10}	H_4	H_2
	3	L_{22}	L_{19}	M_{12}	H_7	H_5
	2	L_{24}	L_{21}	M_{15}	M_{13}	M_8
	1	L_{25}	L_{23}	M_{17}	M_{16}	M_9
Consequence Rating						
		1	2	3	4	5

H = High
M = Moderate
L = Low

2.4 RISK TREATMENT AND ADAPTATION IDENTIFICATION

In the final step of this assessment, and in alignment with the SACC (2022), potential risk treatment and adaptation measures were identified for all estimated climate risks. Adaptation and treatment measures were identified to be applicable to multiple interactions that had similar impacts. Treatment and adaptation measure were identified to mitigate or reduce the climate impacts or likelihood of occurrence associated with each infrastructure component. The resulting expected resilience of infrastructure to climate hazards was then completed. Note, as the Project is still in the planning phase, the objective of this analysis was to understand how these potential climate-related risks can be managed, and at what point in the life of the Project they should be considered for further evaluation and / or treatment. The proposed risk treatment and adaptation measures identified form the basis of how the Project can be resilient to a future climate, and how climate change can be considered as part the continuous improvement process throughout its life.

The level of assessment for the risk treatment and adaptation varied based on the risk score level and were as follows:

- For potential high risks (H7 risks or higher) specific design and infrastructure management measures were identified for each infrastructure type.
- For potential moderate risks (M17 to M8) specific treatment and / or adaptations and measures such as best practices, continual improvement process were identified for each infrastructure type.
- For potential low risks (L25 to L19) the need for treatment and adaptations can be included as part of Operating Maintenance and Surveillance Plans to be developed as part of the operations and post closure phases.

3 CLIMATE CHANGE RISK AND RESILIENCE ASSESSMENT RESULTS

This section provides the results and evaluation of this CCRA. This includes an overview of the climate hazards and Project's infrastructure components assessed, their interactions and estimated risk rankings. Potential future risk treatment and adaption measures were then identified that could be applied to manage these risks.

3.1 CLIMATE HAZARDS AND PROJECT COMPONENTS

In this section a detailed breakdown of the Project's infrastructure components by Project phase and climate hazards that were assessed is provided. Additionally, a summary of the Project's climate-interactions as well as a summary future climate projection trends for the Project site is presented.

3.1.1 PROJECT COMPONENTS AND PHASES

The Project has three phases: construction, operations and closure phases. Both the construction phase as well as the active closure period will be completed over short periods of time. Due to the short-projected timeframe, these phases have not been considered in this assessment, as any climate hazard variation in these timeframes would be within interannual variation rather than long-term variation due to climate change. The assessment focused on the operations, and post-closure phases. Following the current proposed schedule, the operations phase of the Project is expected to last 25 years which will begin in 2030 and carry through to 2055. Active closure is expected to last three years from 2056 to 2058, to be followed by a period of site management while the mine workings of filling with water and a final closure period when water management infrastructure is decommissioned. These closure-related activities and monitoring will extend to the early 2060's, followed by post-closure. As such, infrastructure associated with the operations phase of the Project were assessed against the 2050s climate change projections. The 2080s climate change projections were uses to assess potential climate risk associated with infrastructure that will remain on site post-closure.

A description of all infrastructure assessed as part of the operations phase of the Project is presented in Table 8. A description of all infrastructure assessed as part of the post closure phase of the Project is presented in Table 10.

Table 8: Infrastructure List – Operations

Type	Infrastructure	Description
Mining and Aggregate Infrastructures	Surface portals, ramps, underground workings, shaft, headframe and hoist room	Ore will be extracted from underground working with conventional drilling and blasting using explosives. Ore will be transported by truck to the surface via the ramp and shaft later in the mine life. Personnel will access the workings by the ramp and shaft. Portals and raises to surface will maintain ventilation requirements and help meet safe working environment.
	LP Central pit	The will operate during initial years of the mine life (approximately nine year). Water in the pits will be managed by sump(s) and pumping stations.
	Mine rock stockpiles	Storage capacity is approximately 165 Mt. The mine rock will also be re-used as aggregate or as underground rockfill as appropriate.
	Ore stockpiles (run of mine and low grade ore)	The run of mine consists of uncrushed rock directly transported from the mine. Its storage capacity ranges 0.1 to 0.5 Mt compared to the low grade ore stockpile reaching 5 to 20 Mt. The ore from these stockpiles are conveyed to the on site crushing facility.
	Overburden and organic soil / organics stockpiles	Overburden will be trucked from open pit to overburden stockpiles. Two primary and potentially four supplemental overburden stockpiles are proposed, located close to the source. Stockpiled overburden will be used for progressive reclamation during operations.
	Sand and gravel pits, quarries	Quarries and sand and gravel pits will continue to operate on the property as needed.
Tailings Management	Viggo Management Facility (VMF)	Concentrated tailings which are potentially acid generating, will be piped to the repurposed pit to be stored under water throughout operations.
	TMF	Majority of tailings will be desulphurized, thickened and piped to the TMF which is an on-surface storage area.
	Tailings pipelines	The tailings pipelines carry tailings from the process plant to the final destinations (TMF or VMF).
	TMF and mine water ponds and associated dams	Contact water from the TMF is managed including use of downstream pond(s) and is sent for treatment prior to discharge to the environment (Chukuni River) as needed.
Buildings and Supporting Infrastructures / Systems	Crushed ore facility (potentially covered), process plant, conveyance system, backfill plants and similar	Run of mine and low grade ore will be transported to the crushing facility. Once crushed, the ore is conveyed to the process plant for gold recovery. Processing will include several stages such as grinding and classification, and cyanide leaching to separate gold from the gangue leading to production of doré bars.

Type	Infrastructure	Description
	Permanent camp, service and administration, mine dry, core storage, cold and warm storage buildings, facilities, laboratory and outbuildings	The new permanent facilities will be connected by roads and have water (piping) and power supply as needed.
	Communication systems	Infrastructures in place to allow communication on site, like wired networking, physical security systems and satellite links for example.
	Explosive storage facility, explosive magazines, and reagent storage	Explosives storage area will be maintained on surface and underground. All storage facilities will be managed to meet federal regulatory requirements. Explosives will be manufactured by an external company.
Integrated Water Management System	Chukuni effluent discharge pipeline and diffuser, and freshwater pipeline	Additional pipelines will be established to draw freshwater and discharge the water from the effluent treatment plant to the Chukuni River.
	In-pit and underground sumps and pumps and freshwater pumphouse	Water in the pits will be collected by sumps and pumped at the surface for proper dewatering of the open pits and the underground mine.
	Effluent treatment plant	The plant is designed to ensure all regulatory requirements are met to discharge water to environment (Chukuni River).
	Exterior and firewater tankages	There will be firewater tank (or pond) established to provide sufficient water to respond to a potential Project fire together with all other site ponds.
	Dixie Creek flood protection berm	A berm will be established to mitigate potential flooding from the Dixie Creek.
	Unnamed Watercourse 6B diversion ditch, contact water collection ditches, contact water management ponds and culverts	Precipitation and surface runoff that will be in contact with mine-related facilities will be collected in ditches and collection ponds and directed to the water management system including the VMF, as needed for treatment and discharge. Non-contact water will be diverted away as practical.
	Reject solution management	Excess reject solution from membrane filtration treatment of select contact waters, will be pumped for temporary storage in the west VMF for storage during operations. At closure it will be pumped underground for permanent storage.
	On site well and potable water treatment plant	Freshwater or domestic needs will be provided by on site well or the Chukuni River. Potable water treatment plant will be constructed to treat water for domestic use.
	Domestic sewage treatment plant	Domestic sewage will be treated by an appropriately sized, technically acceptable method such as sewage treatment plant.

Type	Infrastructure	Description
Power Supply	Power line, substation(s) and power distribution (on site)	Power line will be connected to the existing regional electrical grid where it crosses property.
	Natural gas pipeline and power generating facility (on site above ground service connections)	A gas pipeline will connect the existing natural gas pipeline (Enbridge) located on Highway 105 to support on site natural gas power generation.
Roads	Site roads, haul roads, laydown and parking areas (gravel) – on site	A network of roads will be established on site as needed that will be designed to minimize water crossings. New roads will be constructed using aggregate or non-potentially acid generating rock.
	Offsite access (paved)	The main paved access road is the Highway 105, providing year-round access and connection to Red Lake and Ear Falls. Due to the proximity of Red Lake, Ear Falls, and Indigenous communities, Great Bear anticipates that some workers will wish to commute daily from their existing communities. Red Lake and Ear Falls, and other residences are located within about a one-hour drive.
Fish Compensation Areas	Diversion dam and pond along Watercourse 3B, diversion channel, Dixie Creek Pond complex.	Fish compensation areas to offset an estimated 20 ha of impacted fish frequented waterbodies. The purpose is to replace lost fish habitat within the Dixie Creek watershed resulting from the Project. The habitat will be in kind replacement for the waterbodies affected by the Project and will be actively monitored.

Table 9: Infrastructure List – Post Closure Phase

Type	Infrastructure	Description
Post Closure	Secured openings (backfilled portals and capped shaft and raises)	All openings from underground will be secured in accordance with Mine Rehabilitation Code of Ontario. The portals are anticipated to be backfilled with rock. Raises and shaft will be capped with engineering cover (typically reinforced concrete keyed to bedrock).
	Flooded underground workings	Underground workings will be filled with water naturally through groundwater seepage gradually. No long-term discharge is expected from workings.
	LP Central pit lake	Open pit will naturally fill with water through precipitation, groundwater and localized runoff, enhanced by pumping of water as appropriate to create a pit lake. Pit lake water quality will be monitored during filling and managed with treatment if needed. The pit lake will be allowed to overflow by gravity through a constructed channels to a residual tributary of Dixie Creek once the water quality meets all regulatory requirements.
	Reclaimed rock storage areas	Reclamation measures will be put into place to mitigate acid drainage and metal leaching. Design and placement of appropriate cover over potentially acid generating rock that remains on surface is proposed. Mineral waste storage will be revegetated.
	Revegetated TMF	TMF surface will be covered and revegetated.
	VMF	Concentrate tailings will remain covered permanently in an isolated water-covered facility having a stable water level below the ground surface
	Other revegetated areas	Project site will be revegetated, through both active seeding and passive revegetation.
	Dixie Creek Protection Berm	Dixie Creek flood protection berm will be reshaped to allow an overflow spillway from the LP Central pit lake to Unnamed Watercourse 3, which flows to Dixie Creek.
	Fish compensation areas	Permanent naturalized landscape features that will remain in place that are not actively managed or monitored.

3.1.2 RELEVANT CLIMATE CHANGE HAZARDS

The climate hazards and their associated climate indicators that were used in this assessment are presented in Table 10. Hazards have been grouped into temperature hazards, precipitation hazards and extreme events.

Table 10: List of Climate Hazards and Associated Climate Indicators

	Climate Hazard	Climate Indicator	Unit	Description
Temperature	Temperature Increase	Annual cooling degree days	°C-days	Total degree days above 18°C at which spaces are cooled
		Growing season length	Days	Annual count of days between first span of at least six days where temperature < 5°C
	Extreme Heat	Maximum of Annual Maximum Temperature (TXx)	°C	Maximum temperature within a given year
		Warm spell duration index	Days	Annual count of days with at least 6 consecutive days when daily maximum temperatures are greater than the 90th percentile
	Evapotranspiration	Annual total potential evapotranspiration	mm	Depth of annual total potential evapotranspiration
	Drought	Consecutive dry days	Days	Maximum length of dry spell with precipitation < 1 mm
	Extended Cold Spells	Cold spell duration index	Days	Annual count of days with at least 6 consecutive days when daily minimum temperatures are less than the 10th percentile
	Freeze-thaw Cycles	Annual number of freeze-thaw cycles	Cycles	Number of days where maximum daily temperature is above 0°C and minimum daily temperature is at or below 0°C
Precipitation	Precipitation Increase (1)	Annual total precipitation	mm	Depth of annual total precipitation
	Extreme Precipitation (1)	1 day 100-year event	mm	Depth of precipitation falling in a 1-day duration for a given return period
	Flooding	Extreme combined rainfall and snowmelt	mm	Combination of extreme rainfall and snowmelt during spring freshet over 30-day duration
	Snowfall	Extreme snowpack	mm (water equivalent)	Peak snow accumulation over October through June period
Extreme Events	Freezing Rain	1/50 ice accretion thickness	mm	Depth of annual total freezing rain with a return period of 50 years
	High Winds	1/2 wind speed	m/s	Annual maximum wind speed with a return period of 2 years
		1/10 wind speed	m/s	Annual maximum wind speed with a return period of 10 years
		1/100 wind speed	m/s	Annual maximum wind speed with a return period of 100 years
	Wildfires	Fire Weather Index	n/a	Numeric rating of fire intensity

Note:

1 Increased precipitation represents a chronic increase in precipitation annually, while extreme precipitation represents an increase in acute precipitation events.

3.1.3 PROJECT COMPONENT CLIMATE INTERACTIONS

The number of climate interactions identified in this assessment are summarized in Table 11. These are summarized by infrastructure component and climate hazards. An interaction was identified to exist if a potential physical impact associated with the infrastructure component could occur. For each identified interaction, an interaction description was developed. Interaction descriptions are presented in Appendix A, under the Interaction Description column of the Detailed Climate Change Risk Register.

Table 11: Number of Identified Interactions by Climate Hazard and Infrastructure Type

Infrastructure type	Temperature Increase	Extreme Heat	Extended Cold Spell	Evapotranspiration	Freeze-thaw Cycles	Precipitation Increase	Extreme Precipitation	Flooding	Extreme Snowfall	Freezing Rain	Drought	High Winds	Wildfires	Total
Mining and Aggregate Infrastructure	0	1	0	1	1	4	6	3	5	0	1	1	1	24
Tailings Management	0	1	0	3	1	0	4	1	0	0	2	2	1	15
Buildings and Supporting Infrastructure / Systems	1	4	1	0	4	0	4	4	3	2	1	2	4	30
Integrated Water Management System	0	2	0	1	6	2	7	5	4	3	3	2	3	38
Power supply	1	2	1	0	2	0	2	2	2	1	0	1	2	16
Roads	0	1	2	1	2	0	2	2	2	2	1	2	2	19
Fish Compensation Areas	0	1	0	1	0	0	1	1	0	0	1	0	1	6
Post-Closure	0	3	0	6	2	2	7	5	1	1	7	6	6	46
Total	2	15	4	13	18	8	33	23	17	9	16	16	20	194

3.1.4 POTENTIAL CLIMATE OPPORTUNITIES FOR THE PROJECT

Notably, only physical risks have been considered in detail for this assessment and such climate interactions that would result in a potential physical climate change risk. However, to begin to understand potential climate opportunities for the Project, a preliminary, non-exhaustive list of opportunities was created and presented in Table 12. Potential climate change opportunities should be considered in more detail and included in the future as part of the continual improvement process. Although it is acknowledged that potential opportunities due to climate change may exist, they were not the focus of this assessment as the purpose of this CCRA is to identify the potential climate risks to the project. A preliminary, non-exhaustive list of potential climate change opportunities has been included that can be built on as the Project moves forward.

Table 12: Preliminary List of Climate Opportunities

Climate Hazard	Identified Potential Interaction	Interacting Infrastructure	Potential Opportunity
Increased Temperature	Increased temperature could increase vegetation growth on slopes.	Reclaimed pit slopes	Increased growth could be a benefit revegetation during post-closure
	Increased temperatures could increase vegetation growth on reclaimed mineral waste storage areas.	Reclaimed mineral waste storage areas	
	Increased temperatures could increase vegetation growth on reclaimed areas.	Revegetated areas	

Note:

This table represents a preliminary list of potential climate opportunities based on the Project information provided at the time of this report. Additional climate opportunities may be identified and added to this list as the Project moves through design and operation phases.

3.1.5 CLIMATE DATASET SUMMARY

In WSP (2024), a detailed climate change dataset was prepared for the Project to estimate both current and future projected climatic conditions. A set of climate variables was derived to assist in technical studies at the site, including this CCRA. A brief summary of the projected changes in climate evaluated in WSP (2024) is provided in Table 13.

Table 13: Summary of Future Climate Projections for Climate Variables Assessed in WSP (2024)

Climate Variable	Direction of Change	Confidence Level [1]	Description
Average Temperature	Increasing	Fact	– Annual average temperature is projected to increase by 2.5°C in the 2050s and 3.4°C in the 2080s at the 50th percentile, indicating an increasing trend due to changing climate. – Greatest projected changes identified in the winter months
Annual Total Precipitation	Increasing	Fact	– Annual total precipitation is projected to increase by 4% in the mid-century and 6% in the late- century, indicating an upward trend in precipitation on the annual scale at the 50th percentile. – Greatest projected changes identified during the winter months.
Extreme Temperature Indices	Increasing	Fact	– Fewer frost and ice days, more summer days and greater temperature extremes (lowest minimum and maximum temperature, highest minimum and maximum temperature) are projected. – Changes in temperature extremes projected to continue further into the future

Climate Variable	Direction of Change	Confidence Level [1]	Description
Extreme Precipitation / Flooding	Increasing	Likely / High Confidence	– The annual amount of precipitation on wet days, and annual maximum precipitation amounts are projected to increase. – Increasing number of heavy and very heavy wet days suggest that precipitation intensity may increase. – Majority of projected change is estimated for mid-century, with a small but continued change for late-century period.
Extreme Combined Rainfall and Snowmelt	Variable	Medium Confidence	– Projected changes depend on the composition of the extreme events (rain versus. snowmelt) for a given duration. – Projected increases estimated for shorter durations (less than 7 days) that are primarily composed of rainfall – Durations from 7 to 20 days are projected to decrease due to less snowpack available for melt from increasing temperature under climate change. – Durations beyond 20 days projected to increase as snowpack is typically depleted for melting and rainfall becomes a larger fraction of combined extremes.
Potential Evapo-transpiration	Increasing	Medium Confidence	– Following trends in temperature, potential evapotranspiration rates are projected to increase for all months, with an annual total increase of 10% and 13% for the mid-century and late-century, respectively.
Wind Speed	Variable	Low Confidence	– It was found that in the region surrounding the Project site, annual mean wind speeds were projected to change between 0% to 4%, while 50-year return period maximum wind speeds were projected to change between -12% to 8% (Jeong and Sushama 2019). – Annual average surface wind speeds are projected to decrease by approximately -3% for the 2041 to 2060 period and -5% for the 2081 to 2100 period relative to a 1994-2014 baseline under a high emission scenario (IPCC 2021).
Freeze-thaw Cycles	Increasing	Low Confidence	– Freeze-thaw cycles occurrence is projected to increase by mid-century. – Majority of projected change is estimated for mid-century, with a small but continued change for late-century period.
Freezing Rain	Increasing	Low Confidence	– Freezing rain occurrence is projected to increase by mid-century. – Majority of projected change is estimated for mid-century, with a small but continued change for late-century period.
Wildfire	Increasing	Medium Confidence	– Wildfire index is projected to increase into the mid-century, with little change into the later century.

Note:

1 Confidence levels have been qualitatively applied to WSP (2024) projections using the Canada in a Changing Climate Synthesis Report (Lulham et. al. 2023).

In general, warmer, wetter, and more extreme conditions are projected for the Project, which can drive climate risk. In addition, confidence levels were qualitatively assigned for each climate variable using the confidence scale shown in Table 4. Confidence ratings are based on Canada-wide trends and align with the IPCC.

3.2 RISK ANALYSIS AND EVALUATION

The results of the climate change risk assessment (carried out as described in Section 2) are summarized below to describe the potential impacts of climate change on the infrastructure at the Project, as well as the change in risk from current climate to future climate. The risks are summarized prior to application of treatment and adaptation measures, but with current project in-design measures in place. This was completed to understand where climate change related risks exist, to better inform treatment and adaptation measure identification. The treatment and adaptation measures are evaluated qualitatively in Section 3.3. In addition to this summary, Appendix A – Climate Change Risk Register, provides a matrix containing the infrastructure interactions, impacts, likelihood scores, consequence scores and risk scores used to support the analysis in this section.

Each interaction identified was categorized into high, moderate, and low risks across the three time periods (see Section 2.3.3). Figure 2 presents the number of in interactions by risk level and time period to illustrate the distribution of risk levels and changes in climate risks over time. The current and 2050s time periods have the greatest number of interactions, since these time periods include operating infrastructure. In the 2080s, only post-closure infrastructure will remain, resulting in a lower number of interactions and risks.

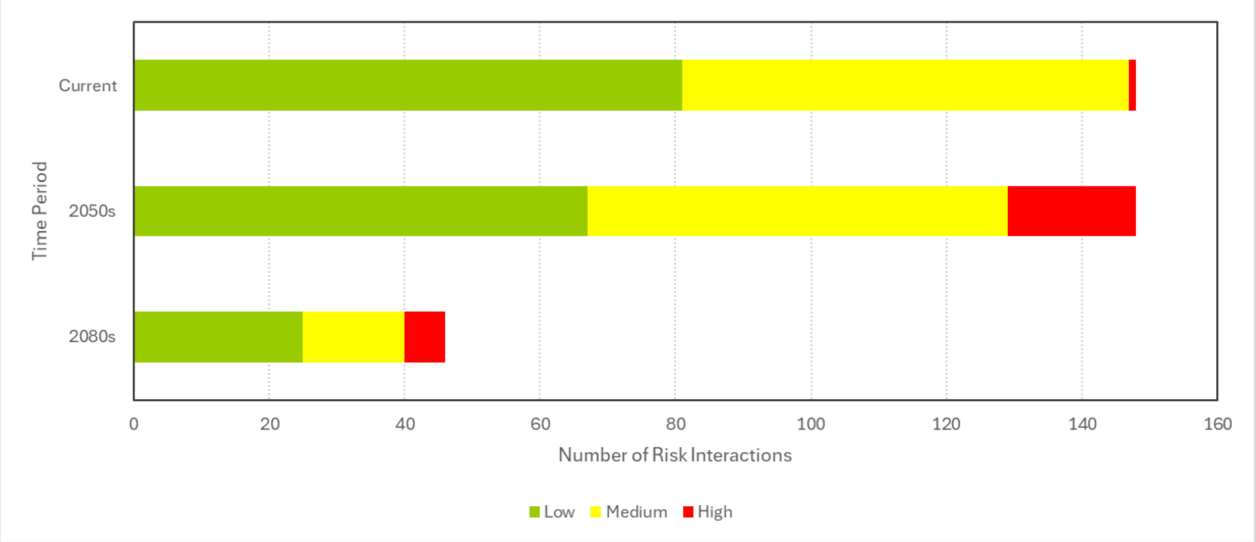

Figure 2: Number of Interactions by Risk Category and Time Period

Comparing the distribution of risk levels, there is an increase in high risks between from the current and 2050s periods. This is driven by the changing climate increasing the likelihood of interactions between the two periods. In the 2080s, the majority of interactions fall into the low and medium risk category, where a smaller proportion of interactions have been estimated to be high risk without any treatment measures. The distribution of risk interactions and how they may change over time is discussed below.

Current Time Period

As noted in Section 2.3.1, likelihood scores for the current time period were set to be lower (unlikely or rare) under the assumption that the Project will be designed to current climate conditions. The only exception to this was for wildfire, where current likelihood level was assigned to a three (possible). This was assigned based on the lower confidence in the climate hazard, the vulnerability of the Project to wildfire events, and the impact wildfire could have on the Project. There is only one high risk identified related to wildfire in the current period where it interacts with tailings management infrastructure. This remains a high risk in the 2050s time period.

Medium risks in the current time period were driven by infrastructure interacting with extreme precipitation and flooding. Although the likelihood scores associated with these climate hazards were assessed as one (rare), the consequences associated with extreme precipitation and flooding interactions were more severe, resulting in medium risks. Other medium risks identified in the current time period were a result of various climate hazards such as extreme winds, freezing rain, and evapotranspiration. These climate interactions also had likelihood scores of one (rare) but had more severe consequences. In addition, these climate hazards had lower confidence associated with the projections.

2050s Time Period

High risks were estimated in five infrastructure categories for the 2050s period: mining and aggregate infrastructure, tailings management infrastructure, buildings and support infrastructure, integrated water management infrastructure, and power supply. These risks are driven by climate change increasing the likelihood of interactions with wildfire, flooding / extreme precipitation, and freeze-thaw cycles. Wildfire and freeze-thaw cycles have lower confidence levels in the projection data. As there is less certainty in these risks results, flexible treatment and adaptation measures allow for updates as more information about the interactions or confidence in the projections becomes available. For wildfire, damage to infrastructure such as buildings, facilities, pipelines, power lines, can be consequential across the site independent of the infrastructure types. In addition, wildfires could be associated with localized environmental contamination depending on the affected component, together with health and safety issues notably through poor air quality and potentially deaths in case of a catastrophic event. It is understood that an Emergency Response Plan will be in place, and firewater tanks are planned for the Project. In the case of wildfire, the proper evacuation of staff and the containment of the fire are very likely sufficient to reduce higher risks at the Project.

Notably, Great Bear Resources is actively integrating climate projections into water management designs for the Project which will help manage high risks associated with extreme precipitation / flooding. When comparing medium risk between the current and 2050s periods, the risks remain relatively consistent related to the smaller changes in the projection data for the relevant climate hazards. Refer to Section 3.3 for details on the proposed treatment and adaptation measures associated with these risks.

Consequence categories that have contributed to the highest risks across all climate hazards for operating infrastructure (current and 2050s time periods) were health and safety, environmental, impact to Indigenous Peoples and Stakeholder relations, and additional costs and Project schedule delay. Consequence drivers were used to support the identification and development of treatment and adaptation measures shown in Section 3.3.

2080s Time Period

Most of the operating infrastructure will be removed before the 2080s time period (based on the current Project schedule) resulting in a lower number of interactions and risks associated with post-closure infrastructure. For post-closure infrastructure, six interactions driven by higher precipitation and flooding were estimated to be high risk. Integrating climate projections into post-closure infrastructure design and maintenance will help manage these high risks by proactively considering potential future climate conditions.

Unlike earlier periods, wildfire was estimated to have moderate risk interactions. There are fewer interactions with the post-closure infrastructure resulting in lower consequence impacts. This is also true for snowfall and freezing rain, which have lower estimated risk interactions.

Since post-closure infrastructure will not be in place until the second half of the century, there is more time to integrate climate change treatment and adaptation measures into the design and management of post-closure infrastructure. Resilient post-closure infrastructure can be achieved by considering future climate impacts during planning, following mining sector guidelines and regulations, and utilizing existing risk management and adaptation plans.

3.3 RISK TREATMENT AND ADAPTATION MEASURES

As a final step, this section suggests potential treatment and adaptation measures for the impacts that were evaluated as potential high, medium and low risks due to climate change. Although high risks have been identified as the focus of the assessment, potential treatment and adaptation measures for low and medium risks were also identified. In Table 14, the climate risks and impacts, and associated treatment and adaptation measures are summarized according to infrastructure category. To help further understand the impacts, they have been organized according to the high, medium and low risks over the future periods. The proposed potential treatment and adaptation measures are applicable to both operation (2050s time period) and post-closure (2080s time period) infrastructure, which is why the risks are summarized across both periods. All risks identified in Section 3.2 are captured in the impact statements. Since high risks pose the greatest potential impacts to the Project, prioritization of risk treatment and adaptation measures should be as follows:

- For potential high risks (H7 risks or higher) risk treatment and adaptation measures should be the highest priority for consideration and should be considered in the detailed design and construction phases as well as infrastructure management plans and procedures. These measures involve the development of design criteria and management strategies that incorporate the projected changes in climate so that infrastructure is resilient to future changes.
- For potential moderate risks (M17 to M8) risk treatment and adaptation measures should be considered the next priority of implementation and/or be incorporated into Best Management Practices Plans along with some design considerations as noted. Great Bear Resource policies to regularly update the Best Management Practices to account for observed conditions, operational and changes in likelihood are incorporated.
- For potential low risks (L25 to L19) existing codes and standards for the infrastructure types as well as the current risk treatment and adaptation measures that will form part of the Operating, Surveillance and Monitoring Plans that will be developed in the operation and post closure phases are sufficient to manage these risks in both the short and long term. Great Bear Resource require plans to be regularly updated so that observed conditions and operational experience are incorporated.

Continued monitoring and review of all climate risks and how they may change over time will promote effective risk management and Project resilience through its lifetime. In addition to this summary, Appendix A – Climate Change Risk Register, provides a Microsoft Excel based matrix containing the potential treatment and adaptation measures for each estimated climate risk.

Table 14: Potential Risk Treatment and Adaptation Measures

Infrastructure Category	Current Climate Risk	Potential Future Climate Risk[2]	Potential Future Climate Impacts[1,2]	Treatment and Adaptation Measure Considerations	Considered Resilient to Climate Change?
Mining and Aggregate Infrastructure	Medium Risks	High Risks	- Erosion and slope stability issues of the pit slopes in case of flooding and extreme precipitation (Confidence level: likely / high confidence). - Flooding / water accumulation in the LP Central pit leading to increased need for dewatering (Confidence level: likely / high confidence).	- Consider climate change projections into water management designs and construction for the proposed site. - Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address / accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Geotechnical and slope stability monitoring to be utilized for LP Central pit.	Yes
	Low to Medium Risks	Medium Risks	- Underground working conditions could become uncomfortable for workers due to extreme heat (Confidence level: fact). - Extreme precipitation could cause flooding and need for dewatering in underground workings, sand and gravel pits (Confidence level: likely / high confidence). - Increased runoff, movement of contaminants from stockpiles, unexpected increase in acid generation from rock, erosion of stockpiles and slope stability concerns (Confidence level: likely / high confidence). - In the case of a wildfire that goes through site, there could be damage to above ground components, which impacts access and procedures of underground workings (Confidence level: medium confidence). - Increased dust in sand and gravel pits, and quarries as a result of dry conditions (Confidence level: medium confidence).	- Incorporate climate change projections into underground working design to accommodate increasing extreme heat and dewatering abilities. - Evaluate the need for cooling infrastructure as a part of the underground ventilation plan and implement if required. - Apply best management practices and monitoring, including climate change considerations, which will be documented in an Erosion and Sediment Control Plan. - Apply fugitive dust best practices and monitoring of dust conditions throughout operations. - Continually update health and safety plans and emergency response plans to help manage potential impacts associated with extreme events throughout operations.	Yes
	Low Risks	Low Risks	- Access issues to site and infrastructure within site due to extreme snowfall / rain on snow events (Confidence level: likely / high confidence) - Groundwater availability could impact soil stability impacting slope stability in VMF and contributing to erosion at the LP Central pit and requirement for increased dewatering (Confidence level: likely / high confidence). - Extreme precipitation and flooding causing erosion of stockpiles (Confidence level: likely / high confidence). - Damage to concrete structures associated with infrastructure from freeze-thaw cycles could cause need for repair and maintenance (Confidence level: low confidence).	- Follow current practices for design of infrastructure. - Include as part of Operating Maintenance and Surveillance Plans.	Yes
Tailings Management	Medium to High Risks	High Risks	- Release of tailings from facility due to extreme precipitation exceeding containment structure capacity (Confidence level: likely / high confidence). - Release of tailings from pipeline due to pipeline damage (freeze-thaw and wildfire) (Confidence level: low to medium confidence). - Wildfire could damage tailings management infrastructure, resulting in a need for repairs and failure of tailings infrastructure outside of typical budgeted ranges (Confidence level: medium confidence).	- Consider climate change projections into water management designs and construction for the proposed site. - Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate	Yes

Infrastructure Category	Current Climate Risk	Potential Future Climate Risk[2]	Potential Future Climate Impacts[1,2]	Treatment and Adaptation Measure Considerations	Considered Resilient to Climate Change?
				new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Follow Canadian Dam Safety Guidelines. - Incorporate Independent Tailings Review Board into planning and management of tailings facilities. - An Operation, Maintenance and Surveillance manual will be developed to facilitate training of staff for safe operation of the TMF dams. The manual will include guidelines for daily, weekly, monthly and quarterly inspections. Procedures for monitoring and surveillance will include background information on the climate change indicators and warning signs that would require corrective action well in advance of any potential event. Geotechnical dam instrumentation will also be used. - Regular inspections of pipelines with ongoing maintenance and appropriate remote monitoring of competence.	
	Low to Medium Risks	**Medium Risks**	- Extreme precipitation could increase contact water managed in the VMF, increasing pumping and treatment needs, with possible inability to treat water fast enough (Confidence level: likely / high confidence). - Extreme heat could cause overheating of equipment involved in moving tailings through pipeline (Confidence level: fact). - Dry conditions (drought and evapotranspiration) could lead to water scarcity in ponds (Confidence level: medium confidence) - Dry conditions (drought and evapotranspiration) or high wind could cause dust conditions on TMF causing increased need for dust management practices (Confidence level: medium to low confidence).	- Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Consider future extreme precipitation regimes into treatment capacity with continual monitoring procedures for the proposed site. - Implement fugitive dust best practices and continual monitoring of dust conditions throughout operations. - An Operation, Maintenance and Surveillance manual will be developed considering climate change to facilitate training of staff for safe operation of the TMF dams, which will include processes for downed equipment.	**Yes**
	Low Risks	**Low Risks**	- Dry condition could lead to water scarcity at the VMF to maintain full water cover on the concentrate tailings (Confidence level: medium confidence).	- Follow current practices for design of infrastructure. - Include as part of Operating Maintenance and Surveillance Plans.	**Yes**
Buildings and Supporting Infrastructure / Systems	**Medium Risks**	**High Risks**	- Wildfire could cause damage to processing facility, which could cause need for repair or replacement, and could lead to downtime of processing infrastructure on site / costs for repair (Confidence level: medium confidence).	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate.	**Yes**
	Low to Medium Risks	**Medium Risks**	- Freeze-thaw, extreme snowfall / rain on snow, freezing rain, high winds and flooding could damage buildings including the processing plant and	- Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations.	**Yes**

Infrastructure Category	Current Climate Risk	Potential Future Climate Risk[2]	Potential Future Climate Impacts[1,2]	Treatment and Adaptation Measure Considerations	Considered Resilient to Climate Change?
			supporting infrastructure causing increased need for repair and maintenance (Confidence level: low to medium confidence). - Extreme temperature conditions could lead to increased HVAC needs on site. Worker comfort could be compromised (Confidence level: fact). - Explosives facility could be compromised due to extreme weather events such as wildfire (Confidence level: medium confidence).	- Adhere to the explosives act and regulations.	
	Low Risks	Low Risks	- Freeze-thaw, extreme snowfall / rain on snow, freezing rain, high winds and flooding could cause damage and outages for communications infrastructure (Confidence level: low to high confidence). - Freeze-thaw, extreme snowfall, freezing rain, high winds and flooding could damage buildings including the processing plant and supporting infrastructure causing increased need for repair and maintenance (Confidence level: low to high confidence). - Drought leading to water scarcity could lead to reduced ability to meet production demands (Confidence level: medium confidence).	- Follow building code and other infrastructure codes of practice. - Include as part of Operating Maintenance and Surveillance Plans.	Yes
Integrated Water Management System	Medium Risks	High Risks	- Extreme precipitation, flooding could exceed pumping capacity / increased need for pumping causing increased need for dewatering and possible damage to pumps (Confidence level: likely / high confidence). - Increased treatment needs due to increased water on site (extreme precipitation, flooding), could lead to impaired ability to convey water, with potential for release of impacted water (Confidence level: likely / high confidence). - Overwhelming of dams, berms, ditches and culverts on site, leading to release of water and potential for erosion (extreme precipitation and flooding) (Confidence level: likely / high confidence).	- Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Incorporate climate change projections into water management plans including the Dixie Creek Berm for the proposed site. - Design water management infrastructure components to consider extreme rainfall under future climate projections. - Review the water balance periodically and update site-wide water balance as operations progress and adjust as needed.	Yes
	Low to Medium Risks	Medium Risks	- Damage to water treatment / pumping infrastructure due to extreme events (i.e. wildfire and extreme heat). Could lead to impaired water treatment ability (Confidence level: medium confidence to fact). - Damage or overwhelming of domestic sewage plant due to extreme weather events could lead to release of grey water (Confidence level: low confidence to fact). - Mine-impacted water (contact water) leaving site due to extreme rainfall exceeding water management infrastructure capacity, or other extreme events (freezing rain, high winds, etc.) damaging water management infrastructure (Confidence level: likely / high confidence).	- Water management and monitoring plans will be developed inclusive of climate change as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Continually update to best management and maintenance programs for water management infrastructure throughout operations.	Yes
	Low Risks	Low Risks	- Dry conditions contributing to water scarcity, could impact domestic sewage treatment, as well as other damage to extreme climate events (Confidence level: medium confidence). - Drought could impact functioning of well (Confidence level: medium confidence).	- Include as part of Operating Maintenance and Surveillance Plans.	Yes

Infrastructure Category	Current Climate Risk	Potential Future Climate Risk[2]	Potential Future Climate Impacts[1,2]	Treatment and Adaptation Measure Considerations	Considered Resilient to Climate Change?
			- Damage to effluent treatment plant due to extreme weather events could impact ability to treat water (Confidence level: low confidence to fact). - Untreated contact water leaving site due to extreme rainfall exceeding water management infrastructure capacity, or other extreme events (freezing rain, high winds, etc.) damaging water management infrastructure (Confidence level: low confidence to high confidence).		
Power supply	Medium Risks	High Risks	- Wildfire could cause damage to power supplies, which could cause need for repair or replacement, and lead to downtime of processing infrastructure on site and investment for repair (Confidence level: medium confidence).	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate.	Yes
	Low to Medium Risks	Medium Risks	- Extreme heat could cause overheating of mechanical equipment and could impact power generation facility (Confidence level: fact). - Extreme cold and freeze-thaw could put thermal stress of natural gas pipelines (above ground connections), weakening components and causing potential damage. Damage could also occur from other extreme weather events such as flooding and extreme snowfall (Confidence level: low confidence to fact). - Extreme heat along with other extreme climate events could impact function of power lines (Confidence level: low confidence to fact).	- Follow codes and practices. - Existing plans for temporary backup power supplies (e.g. diesel generators) will help reduce short-term downtimes if power supply is disrupted related to climate impacts. - Continually update to best management and maintenance programs for both grid, load management and backup power supplies during operations.	Yes
	Low Risks	Low Risks	- Extreme weather events such as freeze-thaw, extreme snow, freezing rain, and high winds could cause damage to power lines (Confidence level: low confidence to high confidence).	- Include as part of Operating Maintenance and Surveillance Plans.	Yes
Roads	No High Risks	No High Risks	- No high risks identified	--	--
	Low to Medium Risks	Medium Risks	- Dry conditions (drought and evapotranspiration) could cause dust on gravel roads, causing increased need for dust management practices (Confidence level: medium confidence). - Extreme precipitation / flooding could increase erosion on roads, leading to washouts and potential site access issues (Confidence level: likely / high confidence). - Extreme conditions such as wildfire and extreme snowfall could lead to site access issues (Confidence level: medium confidence to high confidence).	- Consider climate change projections into road design for the proposed site. - Follow codes and practices. - Implement fugitive dust best practices and continual monitoring of dust conditions throughout operations. - Continually update to best management and maintenance programs for roads management during operations.	Yes
	Low Risks	Low Risks	- Freeze-thaw, extreme snowfall, freezing rain, high winds and flooding could cause access issues and damage to roads (Confidence level: low confidence to high confidence). - Extreme heat could lead to softening of pavement, causing rutting in pavement and increased need for maintenance (offsite access roads) (Confidence level: fact).	- Include as part of Operating Maintenance and Surveillance Plans.	Yes
Fish Compensation Areas	Low to Medium Risks	Low to Medium Risks	- Extreme heat could affect water temperatures thereby impacting the health of the fish. - Evapotranspiration could affect water levels with potential impacts to the fish.	- Select species based on their habitat preferences as per the Fish Habitat Compensation Plan, with consideration for climate change. - Consider climate change in design	Yes

Infrastructure Category	Current Climate Risk	Potential Future Climate Risk[2]	Potential Future Climate Impacts[1,2]	Treatment and Adaptation Measure Considerations	Considered Resilient to Climate Change?
			- Flooding out of water could have potential detrimental impacts to the health of fish. - Extreme precipitation could cause erosion of edges of unnamed water bodies that are planned for fish habitat. This could reduce quality of habitat. - Drought could result in reduced water levels with potential impacts to the health of the fish. - Wildfire could cause vegetation in habitat to die off, which could require revegetation. - Wildfire could cause debris in the water which could reduce quality of habitat.	- A combination of onsite monitors, and qualified designates will monitor effectiveness and document compliance with the approved plans. - The detailed design for the diversion channel and reconstructed Unnamed Watercourse 6b will be informed by a detailed topographical survey to confirm grades and elevations to ensure fish passage, as well as a detailed geomorphological design to confirm and design channel diagnostics reflective of the modeled flow. - A combination of onsite monitors, and qualified designates will monitor effectiveness and document compliance with the approved plans.	
Post-Closure	**No Risks**	**High Risks**	- Inability to keep Mine Rock Stockpile pits slopes and other revegetated areas stable due to erosion, changes in groundwater level, in the event of high precipitations (Confidence level: likely / high confidence). - Freeze-thaw cycles could affect the potentially acid generating Mine Rock Stockpile cover performance and may result in the desiccation of the cover, resulting in cracking and an increase in oxygen ingress and decrease is seepage water quality (Confidence level: low confidence). - Failure of the TMF dam and containment structures with increasing precipitation (Confidence level: likely / high confidence).	- Use Great Bear Resources existing monitoring and reporting practices to monitor climate over the operations phase to better understand how observed changes in climate hazards and the mine infrastructure may impacting post-closure. - Consider climate change projections in detailed design of post-closure infrastructure and update of interim and final closure plan. - Final Closure plan will be reviewed based on the above data.	**Yes**
	No Risks	**Medium Risks**	- Extreme precipitation / flooding could lead to excessive flow through the constructed channels, leading to erosion of the channel (Confidence level: likely / high confidence). - Dry conditions could slow filling of pit lakes (Confidence level: medium confidence). - Erosion of reclaimed pit slopes could occur due to extreme precipitation (Confidence level: likely / high confidence). - Increased runoff from stockpiles and vegetated areas due to extreme precipitation could increase erosion and impact stability (Confidence level: likely / high confidence). - Difficulty to reach acceptable water quality in the pit lakes due to dry conditions resulting in increased treatment requirements (Confidence level: medium confidence).	- Continually update to best management and maintenance programs for water management and other infrastructure during post-closure design and into post-closure.	**Yes**
	No Risks	**Low Risks**	- Vegetation die off could occur due to extreme weather events such as extreme heat, drought, wildfire, drought (Confidence level: low confidence to high confidence).	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	**Yes**

Notes:

There could be the same risk summary in the Climate Change Related Risk Summaries column for the same infrastructure category under different risk ratings. This is because a variety of risk scores could be associated with the same impact depending on the specific climate hazard causing the impact. Multiple climate hazards could cause the same impact, such as wildfire, extreme wind, and extreme snowfall causing damage to buildings, and fall under the term extreme events in this summary.

1 For each future climate impact statement, confidence levels for the associated climate hazards have been included in brackets following the impact statements for context.

2 Includes future risks and impacts associated with climate interactions for operations infrastructure (2050s) and post-closure infrastructure (2080s).

4 CLIMATE CHANGE RESILIENCE

This CCRA considers infrastructure components for the operations and post-closure phases of the Project. Through the CCRA, it was identified that climate interactions have a range of potential physical climate risks, from low risk to high risks. Treatment and adaptation measures have been identified that could be implemented through the design, operation and post-closure phases of the Project to manage these climate risks. Many of these treatment measures are consistent with already developed best management practices that Kinross Gold Corporation has developed for Great Bear Resources as part of their corporate responsible mining principles.

As mentioned in this report, climate risks were first assessed without the consideration of future climate in the design. This was completed to understand what potential climate risks could result in the largest impacts on the Project and then identify potential treatment and adaptation measures that can manage those risks effectively so that the Project is resilient to future climate. Identification of risk treatment and adaptation measures was completed systematically, evaluating each climate interaction risk identified by considering the underlying impact associated with each interaction, and its estimated risk level so that the treatment and adaptation measure intervention matched the associated perceived risk to the Project. Finally, an evaluation of how resilient infrastructure may be to a future climate if treatment and adaptation measures were implemented for associated infrastructure. The resulting expected climate resilience for risks has been included in Table 14 as well as part of Appendix A – Climate Change Risk Register.

The performance of the implemented measures should be monitored throughout the duration of the Project. As a part of the continual improvement process, an ongoing monitoring and surveillance program could be implemented. This continual improvement process could be used to outline the decision-making process for when action needs to be taken to improve climate resilience. The continual improvement process could be updated through an ongoing process over the lifetime of the Project. This could also include building on the preliminary list of potential climate change opportunities for the Project. The results from the monitoring programs could be integrated into a continual improvement process to test the effectiveness of resilience and adaptation actions and manage the unexpected outcomes.

By following this continual improvement approach, and with the implementation with the proposed treatment and adaptation measures provided in Section 3.3, the Project will be expected to be resilient to a changing climate over its planned lifetime.

5 REFERENCES

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Appendix A
Climate Change Risk Register

Infrastructure Category	Infrastructure Component	Climate Hazard	Confidence Level	Interaction Description	Consequence Ratings – Dollar Impact: Dollar Impact (revenue, cost, project budget, value)	Justification	Project Schedule Delay	Justification	Licence to Operate: Indigenous Peoples and Stakeholder Relations & Reputation (Operations)	Justification	Indigenous Peoples and Stakeholder Relations & Reputation (Corporate)	Justification	Environment	Justification	Safety: Health and Safety	Justification	Max. Consequence Score	Current SSP1-2.6 Likelihood Score	Current SSP2-4.5 Likelihood Score	Current SSP5-8.5 Likelihood Score	Max Likelihood Current	2050s SSP1-2.6 Likelihood Score	2050s SSP2-4.5 Likelihood Score	2050s SSP5-8.5 Likelihood Score	Max Likelihood 2050s	2080s SSP1-2.6 Likelihood Score	2080s SSP2-4.5 Likelihood Score	2080s SSP5-8.5 Likelihood Score	Max Likelihood 2080s	Risk Score Current	Risk Score (2050s)	Risk Score (2080s)	Potential Treatment	Expected Treatment Impact	Resilient Statement
Mining and Aggregate Infrastructure	Surface portals, ramps and underground working, shaft, headframe and hoist room	Extreme heat	Fact	Extreme heat including heat waves could cause warmer conditions in underground workings, which could reduce worker comfort and cause unsafe working conditions. Could increase the need for cooling mechanisms.	1	Incidental event	1	Incidental event	2	May cause opposition due to health and safety issues	2	May lead to minor loss of confidence due to inadequate health and safety plan/management of underground workings	1	Should not require cleanup	2	Heat could leat to minor injuries	2	2	2	2	2	4	4	4	4	–	–	–	–	L21	M14	–	- Incorporate climate change projections into underground working design to accommodate increasing extreme heat and dewatering abilities. - Evaluate the need for cooling infrastructure as a part of the underground ventilation plan and implement if required. - Continually update health and safety plans and emergency response plans to help manage potential impacts associated with extreme heat throughout operations.	- Consideration of future climate conditions in underground working design and operations will provide resilience to extreme heat event risks.	Considered Resilient to Climate Change Post-Treatment.
		Freeze-thaw Cycles	Low Confidence	Increased freeze-thaw cycles could increase damage to the concrete structures and cause degradation and increased need for repair.	1	Incidental event; Maintenance probably included in the budget; Costs for fines/legal actions in case of fatalities	1	Should be included in the regular maintenance actions	1	Degraded concrete would not impact relations	1	Degraded concrete would not impact relations	1	Should not require cleanup	2	Rock wall failure could lead to a catastrophic event causing death	2	1	1	1	1	2	3	3	3	–	–	–	–	L23	L19	–	- Follow current practices for design of infrastructure. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for mining and aggregate infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could pose risks for flooding and increased need for dewatering practices.	2	Slowdown or shutdown underground infrastructures dewatering can lead to a temporary shutdown in production and thus to loss of revenue.	2	Time to get the ore extraction going after increased dewatering needs in underground infrastructures may take more than 2 weeks	2	May lead to some opposition in case of insufficient dewatering of the underground workings	3	May lead to limited loss of confidence in case of severe injury due to inadequate water analysis or management	1	Should not require cleanup	3	Flash flooding in the underground working can lead to severe injury	3	1	1	1	1	3	2	3	3	–	–	–	–	M17	M12	–	- Incorporate climate change projections into underground working design to accommodate increasing extreme heat and dewatering abilities. - Apply best management practices and monitoring, including climate change considerations, which will be documented in an Erosion and Sediment Control Plan.	- Consideration of future climate conditions in underground working design and operations will provide resilience to extreme precipitation event risks. - Implementation of best management practices will adapt to manage future extreme heat working condition, dewatering needs, runoff, movement of contaminants, stability risks, and dust condition risks.	Considered Resilient to Climate Change Post-Treatment.
		Flooding	Likely / High Confidence	Flooding could pose risks for water entering underground workings and increasing need for dewatering practices.	2	Slowdown or shutdown underground infrastructures dewatering can lead to a temporary shutdown in production and thus to loss of revenue.	2	Time to get the ore extraction going after increased dewatering needs in underground infrastructures may take more than 2 weeks	2	May lead to some opposition in case of insufficient dewatering of the underground workings	3	May lead to limited loss of confidence in case of severe injury due to inadequate water analysis or management	1	Should not require cleanup	3	Flash flooding in the underground working can lead to severe injury	3	1	1	1	1	4	4	4	4	–	–	–	–	M17	M10	–	- Incorporate climate change projections into underground working design to accommodate increasing extreme heat and dewatering abilities. - Apply best management practices and monitoring, including climate change considerations, which will be documented in an Erosion and Sediment Control Plan.	- Consideration of future climate conditions in underground working design and operations will provide resilience to extreme precipitation event risks. - Implementation of best management practices will adapt to manage future extreme heat working condition, dewatering needs, runoff, movement of contaminants, stability risks, and dust condition risks.	Considered Resilient to Climate Change Post-Treatment.
		Wildfires	Medium Confidence	In the case of a wildfire that goes through site, there could be damage to above ground components, which impacts access and procedures of underground workings.	2	Damage by wildfire related to the underground workings might be of a wider scale and potentially lead to minor costs and minor loss in production	2	Replacement/repair from wildfire damage and staff evacuation may lead to delay of more than 2 weeks	3	Depending on the extent of the damage, the mine could be closed for a certain period of time, creating opposition	3	Potential moderate loss of confidence depending on emergency management	1	Should not require cleanup	3	Smoke in the underground workings can lead to poor air quality and major injuries	3	3	3	3	3	3	3	3	3	–	–	–	–	M12	M12	–	- Continually update health and safety plans and emergency response plans to help manage potential impacts associated with extreme events (including wildfire).	- Implementation of best management practices will adapt to manage future extreme conditions such as wildfire risk.	Considered Resilient to Climate Change Post-Treatment.
	LP Central Pit	Precipitation increase	Fact	Increased precipitation could cause change in amount of groundwater available which could impact soil stability and impact slope stability.	1	Potential very low cost involved due to slope management (included in budget)	1	Incidental event probably incorporated in the pit regular maintenance	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	1	Near miss	1	2	2	2	2	4	4	4	4	–	–	–	–	L24	L20	–	- Follow current practices for design of infrastructure. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for mining and aggregate infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could cause flooding in pits, causing increased dewatering needs and cause erosion of pit slopes, impacting pit slope stability.	2	Increased dewatering needs causing probably minor financial impact on the project due to decreased production	2	Dewatering may take more than 2 weeks	2	Loss of operations may create opposition	2	May lead to minor loss of confidence due to inadequate water management	1	Should not require cleanup	4	Instability of slope may cause death	4	1	1	1	1	3	2	3	3	–	–	–	–	M16	H7	–	- Consider climate change projections into water management designs and construction for the proposed site. - Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Geotechnical and slope stability monitoring to be utilized for open pit monitoring.	- Dewatering and surface water management relating to mine and aggregate pits will be designed and maintained to be resilient to climate change.	Considered Resilient to Climate Change Post-Treatment.
		Flooding	Likely / High Confidence	Flooding could pose risk for flood water entering pit, causing increased need for dewatering, and increasing erosion impacting pit slope stability. The pit locations intersect with the Dixie Creek floodplain.	2	Increased dewatering needs causing probably minor financial impact on the project due to decreased production	2	Dewatering may take more than 2 weeks	2	Loss of operations may create opposition	2	May lead to minor loss of confidence due to inadequate water management	1	Should not require cleanup	4	Instability of slope may cause death	4	1	1	1	1	4	4	4	4	–	–	–	–	M16	H4	–	- Consider climate change projections into water management designs and construction for the proposed site. - Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Geotechnical and slope stability monitoring to be utilized for open pit monitoring.	- Dewatering and surface water management relating to mine and aggregate pits will be designed and maintained to be resilient to climate change.	Considered Resilient to Climate Change Post-Treatment.
		Extreme Snowfall	Likely / High Confidence	Increased extreme snowfall could cause access issues	1	Potential very low cost involved due to slope management (included in budget)	1	Incidental event probably incorporated in the pit regular maintenance	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	2	Potentially hazardous working conditions with heavy snow	2	1	1	1	1	3	3	2	3	–	–	–	–	L23	L19	–	- Follow current practices for design of infrastructure. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for mining and aggregate infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Mine rock stockpiles	Precipitation increase	Fact	Increased precipitation could lead to increased run-off from stockpiles, which could cause increased movement of contamination on and off site. In the case of acid generating mine rock, increased acid generation and leaching could occur.	2	Remediation events causing probably minor financial impact on the project	2	Minor decrease of operations due to remediation/management measures	2	Low impact on production and impact dealt internally	3	May lead to moderate loss of confidence due to inadequate stockpile analyses or management, especially if it implies health and safety issues	3	Remediation required	3	May cause severe injuries if exposed to hazardous products	3	2	2	2	2	4	4	4	4	–	–	–	–	M15	M10	–	- Apply best management practices and monitoring, including climate change considerations, which will be documented in an Erosion and Sediment Control Plan. - Continually update health and safety plans and emergency response plans to help manage potential impacts associated with extreme events throughout operations.	- Implementation of best management practices will adapt to manage future extreme heat working condition, dewatering needs, wildfire risk, runoff, movement of contaminants, stability risks, and dust condition risks. '	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could increase run-off which could cause increased movement of contamination on site and impact stability of stockpile slopes.	2	Remediation events causing probably minor financial impact on the project	2	Minor decrease of operations due to remediation/management measures	2	Limited impact and opposition.	2	May lead to moderate loss of confidence due to inadequate stockpile analyses or management, especially if it implies health and safety issues	3	Remediation required	3	May cause severe injuries if exposed to hazardous products; instability of stockpiles may cause severe injury	3	1	1	1	1	3	2	3	3	–	–	–	–	M17	M12	–	- Apply best management practices and monitoring, including climate change considerations, which will be documented in an Erosion and Sediment Control Plan. - Continually update health and safety plans and emergency response plans to help manage potential impacts associated with extreme events throughout operations.	- Implementation of best management practices will adapt to manage future extreme heat working condition, dewatering needs, wildfire risk, runoff, movement of contaminants, stability risks, and dust condition risks. '	Considered Resilient to Climate Change Post-Treatment.
		Extreme Snowfall	Likely / High Confidence	Extreme snowfall events could result in access issues to stockpiles.	1	Potential very low cost involved due to increased snow and ice management	1	Incidental event with relatively easy/rapid management measures	1	No impact from stockpile access issues	1	No impact from stockpile access issues	1	Minor incident; no cleanup	1	No serious health and safety incident from stockpile access issues.	1	1	1	1	1	3	3	2	3	–	–	–	–	L25	L22	–	- Follow current practices for design of infrastructure. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for mining and aggregate infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Ore Stockpiles (run-of-mine and low grade ore)	Precipitation increase	Fact	Increased precipitation could lead to increased run-off from stockpiles, which could cause increased movement of contamination on and off site. `	2	Increased movement of contamination off-site could result in minor dollar impact due to potential fines and clean up.	1	Increased movement of contamination off-site could result in no real project delay	2	Increased movement of contaminants offsite could lead to some opposition and impact.	2	Increased movement of contaminants offsite could lead to limited impact of confidence in company.	3	Increased movement of contaminants offsite could lead to minor environmental incident with some fines or clean up required.	1	Increased movement of contaminants offsite could lead to no serious health and safety impact.	3	2	2	2	2	4	4	4	4	–	–	–	–	M15	M10	–	- Apply best management practices and monitoring, including climate change considerations, which will be documented in an Erosion and Sediment Control Plan.	- Implementation of best management practices will adapt to manage future extreme heat working condition, dewatering needs, wildfire risk, runoff, movement of contaminants, stability risks, and dust condition risks.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could increase run-off which could cause increased movement of contamination on and off site and impact stability of stockpile slopes.	2	Increased movement of contamination off-site could result in minor dollar impact due to potential fines and clean up.	1	Increased movement of contamination off-site could result in no real project delay	2	Increased movement of contaminants offsite could lead to some opposition and impact.	2	Increased movement of contaminants offsite could lead to limited impact of confidence in company.	3	Increased movement of contaminants offsite could lead to minor environmental incident with some fines or clean up required.	1	Increased movement of contaminants offsite could lead to no serious health and safety impact.	3	1	1	1	1	3	2	3	3	–	–	–	–	M17	M12	–	- Apply best management practices and monitoring, including climate change considerations, which will be documented in an Erosion and Sediment Control Plan.	- Implementation of best management practices will adapt to manage future extreme heat working condition, dewatering needs, wildfire risk, runoff, movement of contaminants, stability risks, and dust condition risks.	Considered Resilient to Climate Change Post-Treatment.

Infrastructure Category	Infrastructure Component	Climate Hazard	Confidence Level	Interaction Description	Consequence Ratings – Dollar Impact: Dollar Impact (revenue, cost, project budget, value)	Justification	Project Schedule Delay	Justification	Licence to Operate: Indigenous Peoples and Stakeholder Relations & Reputation (Operations)	Justification	Indigenous Peoples and Stakeholder Relations & Reputation (Corporate)	Justification	Environment	Justification	Safety: Health and Safety	Justification	Max. Consequence Score	Current SSP1-2.6 Likelihood Score	Current SSP2-4.5 Likelihood Score	Current SSP5-8.5 Likelihood Score	Max Likelihood Current	2050s SSP1-2.6 Likelihood Score	2050s SSP2-4.5 Likelihood Score	2050s SSP5-8.5 Likelihood Score	Max Likelihood 2050s	2080s SSP1-2.6 Likelihood Score	2080s SSP2-4.5 Likelihood Score	2080s SSP5-8.5 Likelihood Score	Max Likelihood 2080s	Risk Score Current	Risk Score (2050s)	Risk Score (2080s)	Potential Treatment	Expected Treatment Impact	Resilient Statement
		Extreme Snowfall	Likely / High Confidence	Extreme snowfall events could result in access issues to stockpiles.	1	Access issued to stockpiles could have incidental dollar impact.	1	Access issued to stockpiles could have project delay of less than 2 weeks.	1	Potential opposition but expected to be minimal.	1	Confidence in company would not be impacted by access issues to stockpiles.	1	Environment would not be impacted by access issues to stockpile.	1	Health and safety would not be impacted by access issues to	1	1	1	1	1	3	3	2	3	–	–	–	–	L25	L22	–	- Follow current practices for design of infrastructure. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for mining and aggregate infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Overburden and organic soil/organics stockpiles	Extreme precipitation	Likely / High Confidence	Extreme precipitation could increase movement of soil through erosion.	1	Movement of soil from overburden would have very little dollar impact	1	Movement of soil from overburden would not cause project delay over 2 weeks.	1	Movement of soil from overburden would not cause notable opposition.	1	Movement of soil from overburden would not impact confidence in company.	1	Movement of soil from overburden would cause minor environmental impact, no remediation needed.	1	Movement of soil from overburden would not cause serious health and safety risk.	1	1	1	1	1	3	2	3	3	–	–	–	–	L25	L22	–	- Follow current practices for design of infrastructure. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for mining and aggregate infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Flooding	Likely / High Confidence	Flooding could cause erosion at base of organics/soil stockpile.	1	Movement of soil from overburden would have very little dollar impact	1	Movement of soil from overburden would not cause project delay over 2 weeks.	1	Movement of soil from overburden would not cause notable opposition.	1	Movement of soil from overburden would not impact confidence in company.	1	Movement of soil from overburden would cause minor environmental impact, no remediation needed.	1	Movement of soil from overburden would not cause serious health and safety risk.	1	1	1	1	1	4	4	4	4	–	–	–	–	L25	L20	–	- Follow current practices for design of infrastructure. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for mining and aggregate infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme Snowfall	Likely / High Confidence	Extreme snowfall events could result in access issues to stockpiles.	1	Access issued to stockpiles could have incidental dollar impact.	1	Access issued to stockpiles could have project delay of less than 2 weeks.	1	Potential opposition but expected to be minimal.	1	Confidence in company would not be impacted by access issues to stockpiles.	1	Environment would not be impacted by access issues to stockpile.	1	Health and safety would not be impacted by access issues to	1	1	1	1	1	3	3	2	3	–	–	–	–	L25	L22	–	- Follow current practices for design of infrastructure. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for mining and aggregate infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		High Winds	Low Confidence	Extreme winds could contribute to erosion of stockpiles and cause potential slope stability issues or dust.	1	Wind erosion and dust would not cause notable dollar impact.	1	Wind erosion and dust would not cause serious project schedule.	1	Wind erosion and dust would not cause notable oppositions	1	Wind erosion and dust would not cause loss of confidence in company.	1	Wind erosion and dust would cause minor environmental incident no remediation.	2	Wind erosion and dust would cause minor health and safety incident due to increased dust inhalation.	2	2	2	2	2	4	4	4	4	–	–	–	–	L21	M14	–	- Apply best management practices and monitoring, including climate change considerations, which will be documented in an Erosion and Sediment Control Plan. - Apply fugitive dust best practices and monitoring of dust conditions throughout operations.	- Implementation of best management practices will adapt to manage future extreme heat working condition, dewatering needs, wildfire risk, runoff, movement of contaminants, stability risks, and dust condition risks.	Considered Resilient to Climate Change Post-Treatment.
	Sand and gravel pits, Quarries	Evapotranspiration	Medium Confidence	Evapotranspiration could contribute to dry conditions, leading to increased dust in sand, gravel pits, and quarries. This could increase the need for dust management measures, and impact health and safety conditions on site.	1	Potential costs for legal and financial penalties, health-related issues and air quality management; KSR p. 73	1	Temporary shutdown from community opposition and changes in regulatory environment; KRS p.73	3	Temporary shutdown/operational disruption and negative impact	3	Low effects on strategy and decision making	3	May lead to legal and financial penalties	2	May cause minor injuries linked to dust (to a lower level than dust from hazardous materials)	3	1	1	1	1	1	2	3	3	–	–	–	–	M17	M12	–	- Apply best management practices and monitoring, including climate change considerations, which will be documented in an Erosion and Sediment Control Plan. - Apply fugitive dust best practices and monitoring of dust conditions throughout operations.	- Implementation of best management practices will adapt to manage future extreme heat working condition, dewatering needs, wildfire risk, runoff, movement of contaminants, stability risks, and dust condition risks.	Considered Resilient to Climate Change Post-Treatment.
		Precipitation increase	Fact	Increased precipitation could lead to change in available groundwater. This could impact the soil stability, impacting the slope stability. Chronic precipitation increase could also contribute to erosion.	1	Potential very low cost involved due to slope management (included in budget)	1	Incidental event probably incorporated in the pit regular maintenance	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	1	Near miss	1	2	2	2	2	4	4	4	4	–	–	–	–	L24	L20	–	- Follow current practices for design of infrastructure. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for mining and aggregate infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could cause erosion of aggregate pits, leading to instability. This could also cause a large influx of water, leading to flooding and need for dewatering.	1	Potential very low cost involved due to slope management (included in budget; and assuming that quarries and sand pits have lower impact on production)	2	Dewatering may take more than 2 weeks	2	loss of operations may create opposition	2	May lead to minor loss of confidence due to inadequate water management	1	Should not require cleanup	3	Instability of stockpiles may cause severe injury	3	1	1	1	1	3	2	3	3	–	–	–	–	M17	M12	–	- Apply best management practices and monitoring, including climate change considerations, which will be documented in an Erosion and Sediment Control Plan. - Continually update health and safety plans and emergency response plans to help manage potential impacts associated with extreme events throughout operations.	- Implementation of best management practices will adapt to manage future extreme heat working condition, dewatering needs, wildfire risk, runoff, movement of contaminants, stability risks, and dust condition risks.	Considered Resilient to Climate Change Post-Treatment.
		Extreme Snowfall	Likely / High Confidence	Increased extreme snowfall could result in access issues to in pits and quarries	1	Potential very low cost involved due to slope management (included in budget; and assuming that quarries and sand pits have lower impact on production)	1	Incidental event probably incorporated in the pits and quarries regular maintenance	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	2	Potentially hazardous working conditions with heavy snow	2	1	1	1	1	3	3	2	3	–	–	–	–	L23	L19	–	- Follow current practices for design of infrastructure. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for mining and aggregate infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Drought	Medium Confidence	Drought could cause dry conditions, leading to increased dust in sand, gravel pits, and quarries. This could increase the need for dust suppressants, and impact health and safety conditions on site.	1	Potential costs for legal and financial penalties, health-related issues and air quality management; KSR p. 73	1	Temporary shutdown from community opposition and changes in regulatory environment; KRS p.73	3	Temporary shutdown/operational disruption and negative impact	3	Low effects on strategy and decision making	3	May lead to legal and financial penalties	2	May cause minor injuries linked to dust (to a lower level than dust from hazardous materials)	3	1	1	1	1	3	3	3	3	–	–	–	–	M17	M12	–	- Apply best management practices and monitoring, including climate change considerations, which will be documented in an Erosion and Sediment Control Plan. - Apply fugitive dust best practices and monitoring of dust conditions throughout operations.	- Implementation of best management practices will adapt to manage future extreme heat working condition, dewatering needs, wildfire risk, runoff, movement of contaminants, stability risks, and dust condition risks.	Considered Resilient to Climate Change Post-Treatment.
	Viggo Management Facility (VMF)	Evapotranspiration	Medium Confidence	Evapotranspiration could lead to water scarcity, reducing water cover of PAG tailing requiring additional water to be sourced.	1	Costs very low as area is water rich and would require little mitigation to provide sufficient cover	1	No delay in operations expected	1	Little to no impact of reputation	1	Little to no impact of reputation	2	Potential for PAG to be exposed to environment however isolated to the pit	1	No change in H&S concerns	2	1	1	1	1	1	2	3	3	–	–	–	–	L23	L19	–	- Follow current practices for design of infrastructure - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for tailings management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme rainfall will increase runoff into VMF, which could result in inability to treat water fast enough, increased treatment rate, and increased storage need.	2	Minor effects on production	1	Incidental event	2	Low impact on production and impact dealt internally	2	May lead to minor loss of confidence due to inadequate water analysis or management	3	May lead to legal and financial penalties; KSR, p. 73	1	Should not affect people's health and safety	3	1	1	1	1	3	2	3	3	–	–	–	–	M17	M12		- Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Consider future extreme precipitation regimes into treatment capacity with continual monitoring procedures for the proposed site.	- Consideration of future climate conditions into the site's water balance will provide resilience to extreme precipitation events and long-term changes to temperature and precipitation. - Implementation of best management practices for tailing management infrastructure will adapt to extreme precipitation, extreme heat, extreme wind, and dry conditions.	Considered Resilient to Climate Change Post-Treatment.
	Tailings Management Facility (TMF)	Evapotranspiration	Medium Confidence	Increased evapotranspiration could cause dust conditions on the TMF. This could increase need for dust management measures	1	Potential costs for legal and financial penalties, health-related issues and air quality management; KSR p. 73	1	Temporary shutdown from community opposition and changes in regulatory environment; KRS p.73	3	Temporary shutdown/operational disruption and negative impact	3	Moderate (Low) effects on strategy and decision making	3	May lead to legal and financial penalties	3	May cause severe injuries if exposed to hazardous products	3	1	1	1	1	1	2	3	3	–	–	–	–	M17	M12	–	- Implement fugitive dust best practices and continual monitoring of dust conditions throughout operations. - Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures.	- Consideration of future climate conditions into the site's water balance will provide resilience to extreme precipitation events and long-term changes to temperature and precipitation. - Implementation of best management practices for tailing management infrastructure will adapt to extreme precipitation, extreme heat, extreme wind, and dry conditions.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could cause an overwhelming of tailings containment structures, causing release of tailings off site. Could also cause need to increase spillway capacities to accommodate larger rainfall events.	3	Impacts related to dam failure and spilling from the TMF may lead to important financial costs	3	Temporary to long-term loss of operations	5	May lead to investigations, results would have negative impacts	5	High effects on strategy and decision making	5	Catastrophic dam failures	3	May cause severe injuries if exposed to hazardous products	5	1	1	1	1	3	2	3	3	–	–	–	–	M9	H5	–	- Consider climate change projections into water management designs and construction for the proposed site. - Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Follow Canadian Dam Safety Guidelines. - Incorporate Independent Tailings Review Board (ITRB) into planning and management of tailings facilities. - An Operation, Maintenance and Surveillance (OMS) manual will be developed to facilitate training of staff for safe operation of the TMF dams. The manual will include guidelines for daily, weekly, monthly and quarterly inspections. Procedures for monitoring and surveillance will include background information on the climate change indicators and warning signs that would require corrective action well in advance of any potential event. Geotechnical dam instrumentation will also be used.	- Spillways and dams as part of tailing management infrastructure will be designed and maintained to be resilient to extreme precipitation events and other extreme climate event risks.	Considered Resilient to Climate Change Post-Treatment.

Infrastructure Category	Infrastructure Component	Climate Hazard	Confidence Level	Interaction Description	Consequence Ratings – Dollar Impact: Dollar Impact (revenue, cost, project budget, value)	Justification	Project Schedule Delay	Justification	Consequence Ratings – Licence to Operate: Indigenous Peoples and Stakeholder Relations & Reputation (Operations)	Justification	Indigenous Peoples and Stakeholder Relations & Reputation (Corporate)	Justification	Environment	Justification	Consequence Ratings – Safety: Health and Safety	Justification	Max. Consequence Score	Current SSP1-2.6 Likelihood Score	Current SSP2-4.5 Likelihood Score	Current SSP5-8.5 Likelihood Score	Max Likelihood Current	2050s SSP1-2.6 Likelihood Score	2050s SSP2-4.5 Likelihood Score	2050s SSP5-8.5 Likelihood Score	Max Likelihood 2050s	2080s SSP1-2.6 Likelihood Score	2080s SSP2-4.5 Likelihood Score	2080s SSP5-8.5 Likelihood Score	Max Likelihood 2080s	Risk Score Current	Risk Score (2050s)	Risk Score (2080s)	Potential Treatment	Expected Treatment Impact	Resilient Statement
Tailings management		Drought	Medium Confidence	Drought could cause increased dust conditions on TMF. This could increase need for dust suppressant sprays.	1	Potential costs for legal and financial penalties, health-related issues and air quality management	1	Temporary shutdown from community opposition and changes in regulatory environment	2	Temporary shutdown/operational disruption and negative impacts	3	Moderate (Low) effects on strategy and decision making	3	May lead to legal and financial penalties	3	May cause severe injuries if exposed to hazardous products	3	1	1	1	1	3	3	3	3	–	–	–	–	M17	M12	–	- Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Implement fugitive dust best practices and continual monitoring of dust conditions throughout operations.	- Consideration of future climate conditions into the site's water balance will provide resilience to extreme precipitation events and long-term changes to temperature and precipitation. - Implementation of best management practices for tailing management infrastructure will adapt to extreme precipitation, extreme heat, extreme wind, and dry conditions.	Considered Resilient to Climate Change Post-Treatment.
Tailings management		High Winds	Low Confidence	High winds could pick up fine particulate on TMF, causing release of dust material.	1	Potential costs for legal and financial penalties, health-related issues and air quality management	1	Temporary shutdown from community opposition and changes in regulatory environment	3	Temporary shutdown/operational disruption and negative impact	3	Moderate (Low) effects on strategy and decision making	3	May lead to legal and financial penalties	3	May cause severe injuries if exposed to hazardous products	3	2	2	2	2	4	4	4	4	–	–	–	–	M15	M10	–	- Implement fugitive dust best practices and continual monitoring of dust conditions throughout operations.	- Implementation of best management practices for tailing management infrastructure will adapt to extreme precipitation, extreme heat, extreme wind, and dry conditions.	Considered Resilient to Climate Change Post-Treatment.
Tailings management	Tailings pipeline	Extreme heat	Fact	Extreme heat could cause overheating of equipment involved in movement of tailings through pipeline.	1	Incidental events causing very low financial impact on the project	2	May lead to temporary shutdown for pipe maintenance	2	Low impact on production and impact dealt internally	1	Likely no impact on confidence	2	May need 3rd party suppliers for repairs	2	Minor risk with proper SME	2	2	2	2	2	4	4	4	4	–	–	–	–	L21	M14	–	- An Operation, Maintenance and Surveillance (OMS) manual will be developed considering climate change to facilitate training of staff for safe operation of the TMF dams, which will include processed for downed equipment.	- Implementation of best management practices for tailing management infrastructure will adapt to extreme precipitation, extreme heat, extreme wind, and dry conditions.	Considered Resilient to Climate Change Post-Treatment.
Tailings management	Tailings pipeline	Freeze-thaw Cycles	Low Confidence	Increased freeze-thaw cycles could damage tailings pipe, partly due to frost heaves, resulting in potential leak of tailings off site.	2	Minor effects on financial performance; KSR p. 63	3	Potential long-term loss of operations (due to leak management and pipe maintenance)	4	Negative impact and potentially strong opposition	4	Probable high impact on strategy and decision making	4	Spilling causing damage	3	May cause severe injuries if exposed to hazardous products	4	1	1	1	1	2	3	3	3	–	–	–	–	M16	H7	–	- An Operation, Maintenance and Surveillance (OMS) manual will be developed to facilitate training of staff for safe operation of the TMF dams. The manual will include guidelines for daily, weekly, monthly and quarterly inspections. Procedures for monitoring and surveillance will include background information on the climate change indicators and warning signs that would require corrective action well in advance of any potential event. Geotechnical dam instrumentation will also be used.	- Spillways, pipelines, and dams as part of tailing management infrastructure will be designed and maintained to be resilient to extreme precipitation events and other extreme climate event risks.	Considered Resilient to Climate Change Post-Treatment.
Tailings management	Tailings pipeline	Extreme precipitation	Likely / High Confidence	Extreme precipitation could cause flooding, leading to damage of tailings pipeline, which could result in a release of tailings off site.	2	Minor effects on financial performance	3	Temporary to long-term loss of operations	4	Negative impact and potentially strong opposition	4	Probable high impact on strategy and decision making	4	Spilling causing damage	3	May cause severe injuries if exposed to hazardous products	4	1	1	1	1	3	2	3	3	–	–	–	–	M16	H7	–	- Consider climate change projections into water management designs and construction for the proposed site. - Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Follow Canadian Dam Safety Guidelines. - Incorporate Independent Tailings Review Board (ITRB) into planning and management of tailings facilities. - An Operation, Maintenance and Surveillance (OMS) manual will be developed to facilitate training of staff for safe operation of the TMF dams. The manual will include guidelines for daily, weekly, monthly and quarterly inspections. Procedures for monitoring and surveillance will include background information on the climate change indicators and warning signs that would require corrective action well in advance of any potential event. Geotechnical dam instrumentation will also be used.	- Spillways, pipelines, and dams as part of tailing management infrastructure will be designed and maintained to be resilient to extreme precipitation events and other extreme climate event risks.	Considered Resilient to Climate Change Post-Treatment.
Tailings management	Tailings pipeline	Flooding	Likely / High Confidence	Flooding could leading to damage of tailings pipeline, which could result in a release of tailings off site.	2	Minor effects on financial performance	3	Temporary to long-term loss of operations	4	Negative impact and potentially strong opposition	4	Probable high impact on strategy and decision making (at a lower level than tailings containment structures)	4	Spilling causing damage	3	May cause severe injuries if exposed to hazardous products	4	1	1	1	1	4	4	4	4	–	–	–	–	M16	H4	–	- Consider climate change projections into water management designs and construction for the proposed site. - Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Follow Canadian Dam Safety Guidelines. - Incorporate Independent Tailings Review Board (ITRB) into planning and management of tailings facilities. - An Operation, Maintenance and Surveillance (OMS) manual will be developed to facilitate training of staff for safe operation of the TMF dams. The manual will include guidelines for daily, weekly, monthly and quarterly inspections. Procedures for monitoring and surveillance will include background information on the climate change indicators and warning signs that would require corrective action well in advance of any potential event. Geotechnical dam instrumentation will also be used.	- Spillways, pipelines, and dams as part of tailing management infrastructure will be designed and maintained to be resilient to extreme precipitation events and other extreme climate event risks.	Considered Resilient to Climate Change Post-Treatment.
Tailings management	Tailings pipeline	Wildfires	Medium Confidence	Wildfire could damage tailing management infrastructure, resulting in significant repairs and failure of tailings infrastructure .	3	Financial impacts related to wildfire on tailing pipelines can be important due to potential spilling and the difficulty of access	3	Potential long-term loss of operations	4	Mine could be closed for a certain period of time, creating strong oppositions	3	Potential moderate loss of confidence depending on how the fire emergency plan has been handled	4	Spilling causing damage	3	May cause severe injuries if exposed to hazardous products	4	3	3	3	3	3	3	3	3	–	–	–	–	H7	H7	–	- Consider climate change projections into water management designs and construction for the proposed site. - An Operation, Maintenance and Surveillance (OMS) manual will be developed to facilitate training of staff for safe operation of the TMF dams. The manual will include guidelines for daily, weekly, monthly and quarterly inspections. Procedures for monitoring and surveillance will include background information on the climate change indicators and warning signs that would require corrective action well in advance of any potential event. Geotechnical dam instrumentation will also be used.	- Spillways, pipelines, and dams as part of tailing management infrastructure will be designed and maintained to be resilient to extreme precipitation events and other extreme climate event risks.	Considered Resilient to Climate Change Post-Treatment.
Tailings management		Evapotranspiration	Medium Confidence	Evapotranspiration could lead to water scarcity, reducing water quality and quantity in ponds, and leading to water quality issues or water scarcity	2	Minor effects on production/revenue	1	Incidental event	2	Low impact on production and impact dealt internally	2	May lead to minor loss of confidence due to inadequate water analysis or management	3	May lead to legal and financial penalties	2	Minor risk with proper SME	3	1	1	1	1	1	2	3	3	–	–	–	–	M17	M12	–	- Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Implement fugitive dust best practices and continual monitoring of dust conditions throughout operations. - An Operation, Maintenance and Surveillance (OMS) manual will be developed considering climate change to facilitate training of staff for safe operation of the TMF dams, which will include processed for downed equipment.	- Consideration of future climate conditions into the site's water balance will provide resilience to extreme precipitation events and long-term changes to temperature and precipitation. - Implementation of best management practices for tailing management infrastructure will adapt to extreme precipitation, extreme heat, extreme wind, and dry conditions.	Considered Resilient to Climate Change Post-Treatment.

Infrastructure Category	Infrastructure Component	Climate Hazard	Confidence Level	Interaction Description	Consequence Ratings – Dollar Impact				Consequence Ratings – Licence to Operate						Consequence Ratings – Safety		Max. Consequence Score	SSP1-2.6 Current	SSP2-4.5 Current	SSP5-8.5 Current	Max Likelihood Current	SSP1-2.6 2050s	SSP2-4.5 2050s	SSP5-8.5 2050s	Max Likelihood 2050s	SSP1-2.6 2080s	SSP2-4.5 2080s	SSP5-8.5 2080s	Max Likelihood 2080s	Risk Score Current	Risk Score (2050s)	Risk Score (2080s)	Potential Treatment	Expected Treatment Impact	Resilient Statement
					Dollar Impact (revenue, cost, project budget, value)	Justification	Project Schedule Delay	Justification	Indigenous Peoples and Stakeholder Relations & Reputation (Operations)	Justification	Indigenous Peoples and Stakeholder Relations & Reputation (Corporate)	Justification	Environment	Justification	Health and Safety	Justification		Likelihood Score	Likelihood Score	Likelihood Score		Likelihood Score	Likelihood Score	Likelihood Score		Likelihood Score	Likelihood Score	Likelihood Score							
	TMF Pond and Mine Water Pond and associated dams	Extreme precipitation	Likely / High Confidence	Extreme precipitation could lead to overwhelming of water containment structures, causing a release of mine impacted water and sediment	3	Impacts related to dam failure and spilling from the TMF may lead to important financial costs	3	Temporary to long-term loss of operations	4	May lead to investigations and negative impacts	4	High effects on strategy and decision making	4	release of mine impacted water (already treated for PAG)	3	May cause severe injuries if large release of water.	4	1	1	1	1	3	2	3	3	–	–	–	–	M16	H7	–	- Consider climate change projections into water management designs and construction for the proposed site. - Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Follow Canadian Dam Safety Guidelines. - Incorporate Independent Tailings Review Board (ITRB) into planning and management of tailings facilities. - An Operation, Maintenance and Surveillance (OMS) manual will be developed to facilitate training of staff for safe operation of the TMF dams. The manual will include guidelines for daily, weekly, monthly and quarterly inspections. Procedures for monitoring and surveillance will include background information on the climate change indicators and warning signs that would require corrective action well in advance of any potential event. Geotechnical dam instrumentation will also be used.	- Spillways, pipelines, and dams as part of tailing management infrastructure will be designed and maintained to be resilient to extreme precipitation events and other extreme climate event risks.	Considered Resilient to Climate Change Post-Treatment.
		Drought	Medium Confidence	Drought causing water scarcity reduces water quality in ponds, and leads to water quality issues.	2	Minor effects on production/revenue	1	Incidental event	2	Low impact on production and impact dealt internally	2	May lead to minor loss of confidence due to inadequate water analysis or management	3	May lead to legal and financial penalties	2	Minor risk with proper SME	3	1	1	1	1	3	3	3	3	–	–	–	0	M17	M12	–	- Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Consider climate change projections into water management designs and construction for the proposed site.	- Spillways, pipelines, and dams as part of tailing management infrastructure will be designed and maintained to be resilient to extreme precipitation events and other extreme climate event risks.	Considered Resilient to Climate Change Post-Treatment.
		High Winds	Low Confidence	Extreme winds could cause increased wave runup, causing a breach of water containment structures releasing some mine contaminated water on site.	2	Impacts related to dam failure and spilling from the TMF may lead to some financial costs	2	Temporary to long-term loss of operations	2	May have some opposition (however this is not a catastrophic failure)	2	Limited impact to confidence in company, as this is not catastrophic event	3	Some release of water due to overtopping, minor incident with possible fine and some remediation required.	2	May cause minor injuries if exposed to hazardous products	3	1	1	1	1	1	1	2	2	–	–	–	–	M17	M15	–	- Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - An Operation, Maintenance and Surveillance (OMS) manual will be developed considering climate change to facilitate training of staff for safe operation of the TMF dams, which will include processed for downed equipment.	- Implementation of best management practices for tailing management infrastructure will adapt to extreme precipitation, extreme heat, extreme wind, and dry conditions.	Considered Resilient to Climate Change Post-Treatment.
	Crushed ore facility (potentially covered), Process plant, Primary crusher, conveyance system, CRF plant, paste plant	Extreme heat	Fact	Extreme heat could cause overheating of mechanical aspects of processing facilities on site, leading to downtime, and increased need for repair.	1	Incidental events causing very low financial impact on the project	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	1	Near miss with proper SME	1	2	2	2	2	4	4	4	4	–	–	–	–	L24	L20	–	- Follow building code and other infrastructure codes of practice. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for buildings and supporting infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Freeze-thaw Cycles	Low Confidence	Increased freeze-thaw cycles could lead to damage of concrete structures in processing plants, which could increase need for maintenance and repair.	1	Potential very low cost involved due to repair and maintenance	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	1	Near miss	1	1	1	1	1	2	3	3	3	–	–	–	–	L25	L22	–	- Follow building code and other infrastructure codes of practice. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for buildings and supporting infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could cause flooding and damage to processing plant infrastructure. This could cause increased need for maintenance and repair and possible downtime of processing infrastructure.	2	Minor effects on financial performance during repairs	3	Damage caused by flooding may need long-term needs for repairs	2	Low impact on production and impact dealt internally	2	May lead to minor loss of confidence due to inadequate water analysis or management	3	Remediation might be required	3	May cause severe injuries if exposed to hazardous products	3	1	1	1	1	3	2	3	3	–	–	–	–	M17	M12	–	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate	- Consideration of future climate conditions into building design and operations will provide resilience to extreme events. - Implementation of best practice measures for buildings and supporting infrastructure will adapt to extreme temperature, precipitation and other extreme events on-site.	Considered Resilient to Climate Change Post-Treatment.
		Flooding	Likely / High Confidence	Flooding could cause damage to processing facilities on site, causing increased need for repair and maintenance, with possible downtime of processing infrastructure.	2	Minor effects on financial performance during repairs	3	Damage caused by flooding may need long-term needs for repairs	2	Low impact on production and impact dealt internally	2	May lead to minor loss of confidence due to inadequate water analysis or management	3	Remediation might be required	3	May cause severe injuries if exposed to hazardous products	3	1	1	1	1	4	4	4	4	–	–	–	–	M17	M10	–	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate	- Consideration of future climate conditions into building design and operations will provide resilience to extreme events. - Implementation of best practice measures for buildings and supporting infrastructure will adapt to extreme temperature, precipitation and other extreme events on-site.	Considered Resilient to Climate Change Post-Treatment.
		Extreme Snowfall	Likely / High Confidence	Extreme snowfall events could cause damage to assets on site, causing increased need for repair and maintenance with possible downtime of processing infrastructure	1	Incidental event causing very low financial impact on the project	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	1	Near miss with proper SME	1	1	1	1	1	3	3	2	3	–	–	–	–	L25	L22	–	- Follow building code and other infrastructure codes of practice. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for buildings and supporting infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Drought	Medium Confidence	Drought leading to water scarcity, could reduce availability of fresh water to allow production demands.	1	Incidental event causing very low financial impact on the project (at a lower level than for tailings as it does not affect water quality)	1	Incidental event	1	Very low impact on production and impact dealt internally	2	May lead to minor loss of confidence due to inadequate water analysis or management	1	Minor incident; no cleanup	1	Near miss with proper SME	2	1	1	1	1	3	3	3	3	–	–	–	–	L23	L19	–	- Follow building code and other infrastructure codes of practice. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for buildings and supporting infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Wildfires	Medium Confidence	In the case that a wildfire goes through site, there could be damage to processing facilities on site, which could cause need for repair or replacement and significant investment for repair.	4	Replacement/repair of buildings may be of moderate effects on production/revenue depending on the fire damage extent	5	May lead to prolonged staff evacuation and moderate delay on production	5	Depending on the extent of the damage, interaction could have vehement opposition	4	Potential moderate loss of confidence depending on how the fire emergency plan has been handled	3	Remediation might be required	3	May lead to severe injuries	5	3	3	3	3	3	3	3	3	–	–	–	–	M12	H6	–	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate	- Consideration of future climate conditions into building design and operations will provide resilience to extreme events. - Implementation of best practice measures for buildings and supporting infrastructure will adapt to extreme temperature, precipitation and other extreme events on-site.	Considered Resilient to Climate Change Post-Treatment.
		Increasing temperature	Fact	Increased temperature could lead to increased HVAC needs in buildings on site.	1	Potential costs for health-related issues and for replacement/repairs of HVAC	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	2	May lead to minor injuries due to temperature discomfort	2	1	1	1	1	4	5	5	5	–	–	–	–	L23	M11	–	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate	- Consideration of future climate conditions into building design and operations will provide resilience to extreme events. - Implementation of best practice measures for buildings and supporting infrastructure will adapt to extreme temperature, precipitation and other extreme events on-site.	Considered Resilient to Climate Change Post-Treatment.
		Extreme heat	Fact	Extreme heat including heat waves could cause warmer conditions, which could reduce worker comfort and cause unsafe working conditions. Could increase the need for cooling mechanisms.	1	Potential costs for health-related issues and for replacement/repairs of HVAC	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	2	May lead to minor injuries due to temperature discomfort	2	2	2	2	2	4	4	4	4	–	–	–	–	L21	M14	–	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate	- Consideration of future climate conditions into building design and operations will provide resilience to extreme events. - Implementation of best practice measures for buildings and supporting infrastructure will adapt to extreme temperature, precipitation and other extreme events on-site.	Considered Resilient to Climate Change Post-Treatment.

Infrastructure Category	Infrastructure Component	Climate Hazard	Confidence Level	Interaction Description	Consequence Ratings – Dollar Impact: Dollar Impact (revenue, cost, project budget, value)	Justification	Project Schedule Delay	Justification	Licence to Operate: Indigenous Peoples and Stakeholder Relations & Reputation (Operations)	Justification	Indigenous Peoples and Stakeholder Relations & Reputation (Corporate)	Justification	Environment	Justification	Safety: Health and Safety	Justification	Max. Consequence Score	Current SSP1-2.6 Likelihood Score	Current SSP2-4.5 Likelihood Score	Current SSP5-8.5 Likelihood Score	Max Likelihood Current	2050s SSP1-2.6 Likelihood Score	2050s SSP2-4.5 Likelihood Score	2050s SSP5-8.5 Likelihood Score	Max Likelihood 2050s	2080s SSP1-2.6 Likelihood Score	2080s SSP2-4.5 Likelihood Score	2080s SSP5-8.5 Likelihood Score	Max Likelihood 2080s	Risk Score Current	Risk Score (2050s)	Risk Score (2080s)	Potential Treatment	Expected Treatment Impact	Resilient Statement
Buildings and Supporting Infrastructure/Systems	Permanent camp, service and administration, mine dry, core storage, cold and warm storage buildings, facilities, laboratory and outbuildings	Freeze-thaw Cycles	Low Confidence	Freeze-thaw cycles could contribute to damage of concrete structures such as buildings, this could lead to increased need for maintenance and repair.	1	Potential very low cost involved for building management (probably included in budget)	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	1	Should not affect people's health and safety	1	1	1	1	1	2	3	3	3	–	–	–	–	L25	L22	–	- Follow building code and other infrastructure codes of practice. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for buildings and supporting infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could lead to flooding and damage to buildings on site leading to increased need for repair and replacement.	2	Replacement/repair of buildings caused by flooding may lead to minor costs	2	May lead to temporary staff evacuation and minor delay on production	2	Loss of production may create opposition	2	May lead to minor loss of confidence due to inadequate water analysis or management	1	Should not require cleanup	2	Hazardous conditions around living environments can lead to minor injuries	2	1	1	1	1	3	2	3	3	–	–	–	–	L23	L19	–	- Follow building code and other infrastructure codes of practice. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for buildings and supporting infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Flooding	Likely / High Confidence	Flooding could cause damage to buildings on site, leading to increased need for repair and maintenance, with possible shut downs while buildings are flooded.	2	Replacement/repair of buildings caused by flooding may lead to minor costs	2	May lead to temporary staff evacuation and minor delay on production	2	Loss of production may create opposition	2	May lead to minor loss of confidence due to inadequate water analysis or management	1	Should not require cleanup	2	Hazardous conditions around living environments can lead to minor injuries	2	1	1	1	1	4	4	4	4	–	–	–	–	L23	M14	–	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate	- Consideration of future climate conditions into building design and operations will provide resilience to extreme events. - Implementation of best practice measures for buildings and supporting infrastructure will adapt to extreme temperature, precipitation and other extreme events on-site.	Considered Resilient to Climate Change Post-Treatment.
		Extreme Snowfall	Likely / High Confidence	Extreme snowfall events could cause damage to buildings on site, causing increased need for repair and maintenance.	1	Potential very low cost involved for building management (probably included in budget)	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	2	Hazardous conditions around living environments can lead to minor injuries	2	1	1	1	1	3	3	2	3	–	–	–	–	L23	L19	–	- Follow building code and other infrastructure codes of practice. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for buildings and supporting infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Freezing Rain	Low Confidence	Freezing rain events could cause damage to buildings on site, causing increased need for repair and maintenance.	1	Potential very low cost involved for building management (probably included in budget)	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	2	Hazardous conditions around living environments can lead to minor injuries	2	1	1	1	1	3	2	3	3	–	–	–	–	L23	L19	–	- Follow building code and other infrastructure codes of practice. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for buildings and supporting infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		High Winds	Low Confidence	Extreme wind events could cause damage to buildings on site, causing increased need for repair and maintenance.	2	Replacement/repair of buildings caused by extreme storms may lead to minor costs	2	May lead to temporary staff evacuation and minor delay on production	2	Loss of production may create opposition	2	May lead to minor loss of confidence due to inadequate building design	1	Should not require cleanup	2	Hazardous conditions around living environments can lead to minor injuries	2	1	1	1	1	3	2	3	3	–	–	–	–	L23	L19	–	- Follow building code and other infrastructure codes of practice. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for buildings and supporting infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Wildfires	Medium Confidence	In the case that a wildfire goes through site, there could be damage to buildings on site, which could cause need for repair or replacement, which could lead to downtime of operations.	3	Replacement/repair of buildings may be of moderate effects on production/revenue depending on the fire damage extent	3	May lead to prolonged staff evacuation and moderate delay on production	2	Loss of production may create opposition	2	Low impact on confidence if fire caused damage to buildings.	1	Should not require cleanup	2	Minor to low injury with proper planning and emergency plans	3	3	3	3	3	3	3	3	3	–	–	–	–	M12	M12	–	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate	- Consideration of future climate conditions into building design and operations will provide resilience to extreme events. - Implementation of best practice measures for buildings and supporting infrastructure will adapt to extreme temperature, precipitation and other extreme events on-site.	Considered Resilient to Climate Change Post-Treatment.
	Communication systems	Extreme heat	Fact	Extreme heat could contribute to degradation of foundation structures (i.e. concrete materials) causing increased need for repair and meantone on communication structures.	1	Replacement/repair of energy infrastructures should be local and lead to vey low costs	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	2	Minor risk with proper SME and safety plans when working during hazardous climate conditions	2	2	2	2	2	4	4	4	4	–	–	–	–	L21	M14	–	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate	- Consideration of future climate conditions into building design and operations will provide resilience to extreme events. - Implementation of best practice measures for buildings and supporting infrastructure will adapt to extreme temperature, precipitation and other extreme events on-site.	Considered Resilient to Climate Change Post-Treatment.
		Freeze-thaw Cycles	Low Confidence	Increased freeze-thaw cycles could cause damage to communication infrastructure, causing increased need for repair and meantone on communication structures.	1	Replacement/repair of energy infrastructures should be local and lead to vey low costs	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	1	Near miss	1	1	1	1	1	2	3	3	3	–	–	–	–	L25	L22	–	- Follow building code and other infrastructure codes of practice. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for buildings and supporting infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could cause damage and outages to communication infrastructure.	1	Replacement/repair of energy infrastructures should be local and lead to vey low costs	2	Repair and replacement after flooding may take more than 2 weeks	2	Loss of production may create opposition	2	May lead to minor loss of confidence due to inadequate water analysis or management	1	Should not require cleanup	2	Minor risk with proper SME and safety plans when working during hazardous climate conditions	2	1	1	1	1	3	2	3	3	–	–	–	–	L23	L19	–	- Follow building code and other infrastructure codes of practice. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for buildings and supporting infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Flooding	Likely / High Confidence	Flooding could contribute to damage to foundation structures, causing increased need for maintenance and repair.	1	Replacement/repair of energy infrastructures should be local and lead to vey low costs	2	Repair and replacement after flooding may take more than 2 weeks	2	Loss of production may create opposition	2	May lead to minor loss of confidence due to inadequate water analysis or management	1	Should not require cleanup	2	Minor risk with proper SME and safety plans when working during hazardous climate conditions	2	1	1	1	1	4	4	4	4	–	–	–	–	L23	M14	–	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate	- Consideration of future climate conditions into building design and operations will provide resilience to extreme events. - Implementation of best practice measures for buildings and supporting infrastructure will adapt to extreme temperature, precipitation and other extreme events on-site.	Considered Resilient to Climate Change Post-Treatment.
		Extreme Snowfall	Likely / High Confidence	Extreme snowfall could cause damage and outages to communication infrastructure.	1	Replacement/repair of energy infrastructures should be local and lead to vey low costs	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	2	Minor risk with proper SME and safety plans when working during hazardous climate conditions	2	1	1	1	1	3	3	2	3	–	–	–	–	L23	L19	–	- Follow building code and other infrastructure codes of practice. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for buildings and supporting infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Freezing Rain	Low Confidence	Freezing rain events could cause ice load on communication poles and lines, causing damage and potential outages.	1	Replacement/repair of energy infrastructures should be local and lead to vey low costs	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	2	Minor risk with proper SME and safety plans when working during hazardous climate conditions	2	1	1	1	1	3	2	3	3	–	–	–	–	L23	L19	–	- Follow building code and other infrastructure codes of practice. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for buildings and supporting infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		High Winds	Low Confidence	Extreme winds could cause damage and outages to communication infrastructure.	1	Replacement/repair of energy infrastructures should be local and lead to vey low costs	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	2	Minor risk with proper SME and safety plans when working during hazardous climate conditions	2	1	1	1	1	3	2	3	3	–	–	–	–	L23	L19	–	- Follow building code and other infrastructure codes of practice. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for buildings and supporting infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Wildfires	Medium Confidence	Wildfires could cause damage and outages to communication infrastructure.	2	Damage by wildfire on the energy infrastructures might be of a wider scale and potentially lead to minor costs	1	Downed communication could cause delays for less than 2 weeks.	2	Loss of production may create opposition	1	No impact on confidence in management of the Company if communication systems were damages.	1	Should not require cleanup	2	Minor to low injury with proper planning and emergency plans	2	3	3	3	3	3	3	3	3	–	–	–	–	L19	L19	–	- Follow building code and other infrastructure codes of practice. - Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for buildings and supporting infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme heat	Fact	Extreme heat could increase need for temperature regulation to keep explosive in stable state.	1	Potential very low cost involved due to repair, maintenance, and HVAC performance	1	Incidental event	1	No impact on production and impact dealt internally	2	May lead to minor loss of confidence due to inadequate health and safety plan/management of explosive	1	Should not require cleanup if properly managed	3	May cause severe injuries if exposed to hazardous products	3	2	2	2	2	4	4	4	4	–	–	–	–	M15	M10	–	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate - Adhere to the explosives act and regulations	- Consideration of future climate conditions into building design and operations will provide resilience to extreme events. - Implementation of best practice measures for buildings and supporting infrastructure will adapt to extreme temperature, precipitation and other extreme events on-site.	Considered Resilient to Climate Change Post-Treatment.
		Extended cold spell	Fact	Extended cold spell could increase need for temperature regulation to keep explosive in stable state.	1	Potential very low cost involved due to repair, maintenance, and HVAC performance	1	Incidental event	1	No impact on production and impact dealt internally	2	May lead to minor loss of confidence due to inadequate health and safety plan/management of explosive	1	Should not require cleanup if properly managed	3	May cause severe injuries if exposed to hazardous products	3	1	1	1	1	2	1	2	2	–	–	–	–	M17	M15	–	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate - Adhere to the explosives act and regulations	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate - Adhere to the explosives act and regulations	Considered Resilient to Climate Change Post-Treatment.
		Freeze-thaw Cycles	Low Confidence	Freeze-thaw cycles could cause increased damage to the explosives storage facility and magazine. This would increase the need for maintenance and repair.	1	Potential very low cost involved due to repair and maintenance	1	Incidental event	1	No impact on production and impact dealt internally	2	May lead to minor loss of confidence due to inadequate health and safety plan/management of explosive	1	Should not require cleanup if properly managed	3	May cause severe injuries if exposed to hazardous products	3	1	1	1	1	2	3	3	3	–	–	–	–	M17	M12	–	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate - Adhere to the explosives act and regulations	- Consideration of future climate conditions into building design and operations will provide resilience to extreme events. - Implementation of best practice measures for buildings and supporting infrastructure will adapt to extreme temperature, precipitation and other extreme events on-site.	Considered Resilient to Climate Change Post-Treatment.

Infrastructure Category	Infrastructure Component	Climate Hazard	Confidence Level	Interaction Description	Consequence Ratings – Dollar Impact: Dollar Impact (revenue, cost, project budget, value)	Justification	Project Schedule Delay	Justification	Licence to Operate: Indigenous Peoples and Stakeholder Relations & Reputation (Operations)	Justification	Indigenous Peoples and Stakeholder Relations & Reputation (Corporate)	Justification	Environment	Justification	Safety: Health and Safety	Justification	Max. Consequence Score	Current SSP1-2.6 Likelihood Score	Current SSP2-4.5 Likelihood Score	Current SSP5-8.5 Likelihood Score	Max Likelihood Current	2050s SSP1-2.6 Likelihood Score	2050s SSP2-4.5 Likelihood Score	2050s SSP5-8.5 Likelihood Score	Max Likelihood 2050s	2080s SSP1-2.6 Likelihood Score	2080s SSP2-4.5 Likelihood Score	2080s SSP5-8.5 Likelihood Score	Max Likelihood 2080s	Risk Score Current	Risk Score (2050s)	Risk Score (2080s)	Potential Treatment	Expected Treatment Impact	Resilient Statement
	Explosive storage facility, Explosive magazines, reagent storage	Extreme precipitation	Likely / High Confidence	Extreme precipitation could cause flooding of explosives facility and magazine, which could lead to seepage of chemicals associated with explosives.	2	Mitigation from seepage of chemical, legal actions and fines may lead to minor costs	2	Environmental mitigation and repairs may lead to delay of more than 2 weeks	3	Bad publicity in case of environmental contamination and injuries	3	May lead to moderate loss of confidence due to inadequate explosive storage and manufacture design, especially if it leads to environmental contamination	3	Remediation required	3	May cause severe injuries if exposed to hazardous products	3	1	1	1	1	3	2	3	3	–	–	–	–	M17	M12	–	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate - Adhere to the explosives act and regulations	- Consideration of future climate conditions into building design and operations will provide resilience to extreme events. - Implementation of best practice measures for buildings and supporting infrastructure will adapt to extreme temperature, precipitation and other extreme events on-site.	Considered Resilient to Climate Change Post-Treatment.
		Flooding	Likely / High Confidence	Flooding could cause flooding of explosives facility and magazine, which could lead to seepage of chemicals associated with explosives.	2	Mitigation from seepage of chemical, legal actions and fines may lead to minor costs	2	Environmental mitigation and repairs may lead to delay of more than 2 weeks	3	Bad publicity in case of environmental contamination and injuries	3	May lead to moderate loss of confidence due to inadequate explosive storage and manufacture design, especially if it leads to environmental contamination	3	Remediation required	3	May cause severe injuries if exposed to hazardous products	3	1	1	1	1	4	4	4	4	–	–	–	–	M17	M10	–	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate - Adhere to the explosives act and regulations	- Consideration of future climate conditions into building design and operations will provide resilience to extreme events. - Implementation of best practice measures for buildings and supporting infrastructure will adapt to extreme temperature, precipitation and other extreme events on-site.	Considered Resilient to Climate Change Post-Treatment.
		Wildfires	Medium Confidence	In the case that a wildfire goes through site, there could be damage to the explosives facility and magazine, causing unintentional detonation, and release of chemical associated with explosives.	2	Mitigation from seepage of chemical, legal actions and fines may lead to minor costs	2	Environmental mitigation and repairs may lead to delay of more than 2 weeks	3	Bad publicity in case of environmental contamination and injuries	3	Potential moderate loss of confidence depending on emergency management	3	Remediation required	3	May lead to a catastrophic event causing severe injury	3	3	3	3	3	3	3	3	3	–	–	–	–	M12	M12	–	- Consider climate change projections for building design for the proposed site. - Follow building code and other infrastructure codes of practice. - Continually update to best management and maintenance programs for building infrastructure throughout operations. - Insurance policy for site to include extreme events where appropriate - Adhere to the explosives act and regulations	- Consideration of future climate conditions into building design and operations will provide resilience to extreme events. - Implementation of best practice measures for buildings and supporting infrastructure will adapt to extreme temperature, precipitation and other extreme events on-site.	Considered Resilient to Climate Change Post-Treatment.
	Chukuni effluent discharge pipeline and diffuser, Freshwater pipeline	Freeze-thaw Cycles	Low Confidence	Freeze-thaw cycles could increase damage to concrete structures, resulting in damage to discharge pipeline and increase need or repair and replacement.	1	Incidental event; Maintenance probably included in the budget	1	Likely no impact on production	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	1	Near miss	1	1	1	1	1	2	3	3	3	–	–	–	–	L25	L22	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could exceed capacity of pipelines, causing damage and increased need for repair and replacement. Could result in mine impacted water leaving site.	1	Incidental event; Maintenance probably included in the budget	2	Repair and replacement after flooding may take more than 2 weeks	2	Loss of production may create opposition	2	May lead to minor loss of confidence due to inadequate water analysis or management	2	May need studies/test to ensure the ecosystems were not impacted/contaminated	2	Minor risk with proper SME and safety plans when working during hazardous climate conditions	2	1	1	1	1	3	2	3	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Flooding	Likely / High Confidence	Flooding could cause flooding on site, which could exceed capacity of pipelines, causing damage and increased need for repair and replacement. Could result in mine impacted water leaving site.	1	Incidental event; Maintenance probably included in the budget	2	Repair and replacement after flooding may take more than 2 weeks	2	Loss of production may create opposition	2	May lead to minor loss of confidence due to inadequate water analysis or management	2	May need studies/test to ensure the ecosystems were not impacted/contaminated	2	Minor risk with proper SME and safety plans when working during hazardous climate conditions	2	1	1	1	1	4	4	4	4	–	–	–	–	L23	M14	–	- Water management and monitoring plans will be developed inclusive of climate change as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Continually update to best management and maintenance programs for water management infrastructure throughout operations.	- Consideration of future climate conditions into water treatment containment infrastructure will provide resilience to extreme events. - Implementation of best practice measures for integrated water management system infrastructure will adapt to future risks to treatment plant / pumping infrastructure, and other water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme Snowfall	Likely / High Confidence	Extreme snowfall events could cause damage to pipelines, causing increased need for repair.	1	Incidental event; Maintenance probably included in the budget	1	Likely no impact on production	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	2	Minor risk with proper SME and safety plans when working during hazardous climate conditions	2	1	1	1	1	3	3	2	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	In-pit and underground sumps and pumps, Freshwater pumphouse	Extreme heat	Fact	Extreme heat could cause overheating of pumping systems, causing down pumping time and need for repair or replacement.	1	Incidental event; Maintenance probably included in the budget	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	1	Near miss	1	2	2	2	2	4	4	4	4	–	–	–	–	L24	L20	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Precipitation increase	Fact	Increased precipitation could cause increased pumping volume resulting in wear on pumping systems causing increased need for maintenance and repair.	1	Incidental event; Maintenance probably included in the budget	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	1	Near miss	1	2	2	2	2	4	4	4	4	–	–	–	–	L24	L20	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could exceed pumping capacity, causing wear on pumps, and need for dewatering in pits and underground workings.	2	Slowdown or shutdown of pits and underground infrastructures dewatering can lead to a temporary shutdown in production and thus to loss of revenue.	2	Time to get the ore extraction going after a unproperly dewatered pits and underground infrastructures may take more than 2 weeks	3	Prolonged shutdown of ore extraction and production may lead to moderate opposition in case of insufficient dewatering of the open pits and underground infrastructures	3	May lead to moderate loss of confidence due to inadequate water analysis or management	4	Potential overflowing of mine impacted waters	3	May cause severe injuries if flooding occurs.	4	1	1	1	1	3	2	3	3	–	–	–	–	M16	H7	–	- Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Design water management infrastructure components to consider extreme rainfall under future climate projections. Design - Review the water balance periodically and update site-wide water balance as operations progress. Adjust accordingly	- Water management system infrastructure will be designed and maintained to be resilient to future extreme precipitation events and flooding.	Considered Resilient to Climate Change Post-Treatment.
		Flooding	Likely / High Confidence	Flooding could increase need for pumping water on site, causing increased volume pumped leading to wear on pumping systems which leads to increased repair and maintenance.	2	Slowdown or shutdown of pits and underground infrastructures dewatering can lead to a temporary shutdown in production and thus to loss of revenue.	2	Time to get the ore extraction going after a unproperly dewatered pits and underground infrastructures may take more than 2 weeks	3	Prolonged shutdown of ore extraction and production may lead to moderate opposition in case of insufficient dewatering of the open pits and underground infrastructures	3	May lead to moderate loss of confidence due to inadequate water analysis or management	4	Potential overflowing of mine impacted waters	3	May cause severe injuries if exposed to hazardous products	4	1	1	1	1	4	4	4	4	–	–	–	–	M16	H4	–	- Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Design water management infrastructure components to consider extreme rainfall under future climate projections. Design - Review the water balance periodically and update site-wide water balance as operations progress. Adjust accordingly	- Water management system infrastructure will be designed and maintained to be resilient to future extreme precipitation events and flooding.	Considered Resilient to Climate Change Post-Treatment.
		Extreme Snowfall	Likely / High Confidence	Extreme snowfall event could cause damage to the pumping systems, increasing need for repair and maintenance.	1	Incidental event; Maintenance probably included in the budget	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	1	Near miss	1	1	1	1	1	3	3	2	3	–	–	–	–	L25	L22	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Freezing Rain	Low Confidence	Freezing rain events could cause damage to the pumping systems, increasing need for repair and maintenance.	1	Incidental event; Maintenance probably included in the budget	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	1	Near miss	1	1	1	1	1	3	2	3	3	–	–	–	–	L25	L22	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Wildfires	Medium Confidence	In the case that a wildfire goes through site, there could be damage to the pumping systems which could cause pumping system downtime.	2	Damage by wildfire on the dewatering system might be of a wider scale and potentially lead to minor costs	3	May lead to prolonged staff evacuation and delayed dewatering causing moderate delay on production	3	Prolonged shutdown of ore extraction and production in case of insufficient dewatering of the open pits and underground infrastructures may lead to moderate opposition	3	Potential moderate loss of confidence depending on emergency management	1	Should not require cleanup	2	Minor to low injury with proper planning and emergency plans	3	3	3	3	3	3	3	3	3	–	–	–	–	M12	M12	–	- Continually update to best management and maintenance programs for water management infrastructure throughout operations.	- Consideration of future climate conditions into water treatment containment infrastructure will provide resilience to extreme events.	Considered Resilient to Climate Change Post-Treatment.
		Extreme heat	Fact	Extreme heat overheating of water treatment infrastructure which could cause need for repair or replacement if over temperature design.	1	Incidental event; Maintenance probably included in the budget	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	2	Minor risk with proper SME and safety plans when working during hazardous climate conditions	2	2	2	2	2	4	4	4	4	–	–	–	–	L21	M14	–	- Continually update to best management and maintenance programs for water management infrastructure throughout operations.	- Consideration of future climate conditions into water treatment containment infrastructure will provide resilience to extreme events.	Considered Resilient to Climate Change Post-Treatment.
		Freeze-thaw Cycles	Low Confidence	Freeze-thaw cycles could cause damage to effluent treatment plant, causing increased need for maintenance and repair.	1	Incidental event; Maintenance probably included in the budget	1	Probably no impact on production	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	1	Near miss	1	1	1	1	1	2	3	3	3	–	–	–	–	L25	L22	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Precipitation increase	Fact	Increased precipitation will cause increased water going through effluent treatment plant.	1	Incidental event; Maintenance probably included in the budget	1	Probably no impact on production	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	1	Near miss	1	2	2	2	2	4	4	4	4	–	–	–	–	L24	L20	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.

Infrastructure Category	Infrastructure Component	Climate Hazard	Confidence Level	Interaction Description	Consequence Ratings – Dollar Impact: Dollar Impact (revenue, cost, project budget, value)	Justification	Project Schedule Delay	Justification	Licence to Operate: Indigenous Peoples and Stakeholder Relations & Reputation (Operations)	Justification	Indigenous Peoples and Stakeholder Relations & Reputation (Corporate)	Justification	Environment	Justification	Safety: Health and Safety	Justification
Integrated Water Management System	Effluent treatment plant	Extreme precipitation	Likely / High Confidence	Extreme precipitation could cause increased throughput in treatment plant - impairment of downstream ability to convey flow. It could also cause increased start/stop and adjustments. Additional, influx of water to treatment system for increased need for treatment.	1	Mine water treatment issues can lead to a slowdown in production and thus to small loss of revenue.	2	Restoring normal flow may take more than two weeks	3	May lead to moderate opposition on water management - Bad publicity if spills/leakages	3	Potential moderate loss of confidence depending on emergency management and due to inadequate water management	4	Potential overflowing of mine impacted waters	3	May cause severe injuries if exposed to hazardous products
		Flooding	Likely / High Confidence	Flooding could cause increased throughput in treatment plant - impairment of downstream ability to convey flow.	1	Mine water treatment issues can lead to a slowdown in production and thus to small loss of revenue.	2	Restoring normal flow may take more than two weeks	3	May lead to moderate opposition on water management - Bad publicity if spills/leakages	3	Potential moderate loss of confidence depending on emergency management and due to inadequate water management	4	Potential overflowing of mine impacted waters	3	May cause severe injuries if exposed to hazardous products
		Extreme Snowfall	Likely / High Confidence	Extreme snowfall could damage the effluent treatment plant, causing need for repair and replacement with potential downtime.	1	Incidental event; Maintenance probably included in the budget	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	1	Near miss
		Freezing Rain	Low Confidence	Freezing rain could damage the effluent treatment plant, causing need for repair and replacement with potential downtime.	1	Incidental event; Maintenance probably included in the budget	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Should not require cleanup	1	Near miss
		Wildfires	Medium Confidence	In the case that a wildfire goes through site, there could be damage to the effluent treatment plant which could cause potential downtime.	2	Damage by wildfire on the effluent treatment plant might be of a wider scale and potentially lead to minor costs	2	May lead to prolonged staff evacuation; Repair and replacement of equipment should take more than 2 weeks	3	Potentially moderate impact on production	3	Potential moderate loss of confidence depending on emergency management	3	Leak or spill leading to environmental damage	2	Minor to low injury with proper planning and emergency plans
	Exterior tankage, firewater tankage	Evapotranspiration	Medium Confidence	Evapotranspiration could contribute to water scarcity, causing issues with firewater tankage supply.	1	Incidental event	2	Potential shutdown if it leads to risks in case of fire	2	Low impact on production and impact dealt internally	2	May lead to minor loss of confidence due to inadequate water analysis or management	1	Minor incident; no cleanup	1	Near miss
		Freeze-thaw Cycles	Low Confidence	Freeze-thaw cycles could damage the tankage, causing need for repair or maintenance.	1	Incidental event; Maintenance probably included in the budget	1	Incidental event	1	Should not impact production and be dealt internally	2	May lead to minor loss of confidence due to inadequate design	1	Minor incident; no cleanup	1	Near miss
		Drought	Medium Confidence	Drought could contribute to water scarcity posing an issue for water supply for tankage.	1	Incidental event	2	Potential shutdown if it leads to risks in case of fire	2	Low impact on production and impact dealt internally	2	May lead to minor loss of confidence due to inadequate water analysis or management	1	Minor incident; no cleanup	1	Near miss
	Dixie Creek flood protection berm, lake/river dams	Freeze-thaw Cycles	Low Confidence	Increased freeze-thaw cycles could damage any concrete structure associated with dams and berms, which could lead to increased repair and maintenance.	1	Incidental event; Maintenance probably included in the budget	1	Regular maintenance	1	Should not impact production and be dealt internally	2	May lead to minor loss of confidence due to inadequate design	1	Minor incident; no cleanup	1	Near miss
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could exceed capacity of dams and berms causing a breach event, with release of mine impacted water.	2	Flooding of the pits can lead to a temporary shutdown in production and thus to loss of revenue.	3	Flooding of the pits can lead to a temporary to a prolonged shutdown of ore extraction and production	3	May lead to moderate opposition on water management - Bad publicity in case of fatalities	3	Potentially major loss of confidence depending on emergency management (in case of fatalities) and due to inadequate water facility design	1	Minor incident; no cleanup	4	Can be a catastrophic event leading to death
		Flooding	Likely / High Confidence	Flooding could cause increased water on site, leading to overwhelming of dams and berms, with potential for erosion.	2	Flooding of the pits can lead to a temporary shutdown in production and thus to loss of revenue.	3	Flooding of the pits can lead to a temporary to a prolonged shutdown of ore extraction and production	3	May lead to moderate opposition on water management - Bad publicity in case of fatalities	3	Potentially major loss of confidence depending on emergency management (in case of fatalities) and due to inadequate water facility design	1	Minor incident; no cleanup	4	Can be a catastrophic event leading to death
		High Winds	Low Confidence	Extreme winds could cause increased wave runup, causing a breach of water containment structures releasing some mine contaminated water on site.	1	Incidental event; Maintenance probably included in the budget	1	Regular maintenance	1	Should not impact production and be dealt internally	2	May lead to minor loss of confidence due to inadequate design	1	Minor incident; no cleanup	1	Near miss
		Extreme precipitation	Likely / High Confidence	Extreme rainfall could overwhelm ditches and culverts on site, causing release of mine impacted water. Extreme rainfall could also cause debris blocking ditches and culverts, increasing chance of overtopping.	2	Potentially minor costs associated with environmental remediation	2	Repair and replacement after flooding may take more than 2 weeks	3	May lead to moderate opposition on water management - Bad publicity in case of environmental contamination	3	Potentially major loss of confidence depending environmental remediation and due to inadequate water facility design	4	Potential overflowing of mine impacted waters	3	May cause severe injuries if exposed to hazardous products

Infrastructure Component	Climate Hazard	Max. Consequence Score	Current: SSP1-2.6 Likelihood Score	Current: SSP2-4.5 Likelihood Score	Current: SSP5-8.5 Likelihood Score	Max Likelihood Current	2050s: SSP1-2.6 Likelihood Score	2050s: SSP2-4.5 Likelihood Score	2050s: SSP5-8.5 Likelihood Score	Max Likelihood 2050s	2080s: SSP1-2.6 Likelihood Score	2080s: SSP2-4.5 Likelihood Score	2080s: SSP5-8.5 Likelihood Score	Max Likelihood 2080s	Risk Score Current	Risk Score (2050s)	Risk Score (2080s)	Potential Treatment	Expected Treatment Impact	Resilient Statement
Effluent treatment plant	Extreme precipitation	4	1	1	1	1	3	2	3	3	–	–	–	–	M16	H7	–	- Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Incorporate climate change projections into water management plans including the Dixie Creek Berm for the proposed site. - Design water management infrastructure components to consider extreme rainfall under future climate projections. Design - Review the water balance periodically and update site-wide water balance as operations progress. Adjust accordingly	- Water management system infrastructure will be designed and maintained to be resilient to future extreme precipitation events and flooding.	Considered Resilient to Climate Change Post-Treatment.
	Flooding	4	1	1	1	1	4	4	4	4	–	–	–	–	M16	H4	–	- Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Incorporate climate change projections into water management plans including the Dixie Creek Berm for the proposed site. - Design water management infrastructure components to consider extreme rainfall under future climate projections. Design - Review the water balance periodically and update site-wide water balance as operations progress. Adjust accordingly	- Water management system infrastructure will be designed and maintained to be resilient to future extreme precipitation events and flooding.	Considered Resilient to Climate Change Post-Treatment.
	Extreme Snowfall	1	1	1	1	1	3	3	2	3	–	–	–	–	L25	L22	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Freezing Rain	1	1	1	1	1	3	2	3	3	–	–	–	–	L25	L22	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Wildfires	3	3	3	3	3	3	3	3	3	–	–	–	–	M12	M12	–	- Continually update to best management and maintenance programs for water management infrastructure throughout operations.	- Consideration of future climate conditions into water treatment containment infrastructure will provide resilience to extreme events.	Considered Resilient to Climate Change Post-Treatment.
Exterior tankage, firewater tankage	Evapotranspiration	2	1	1	1	1	1	2	3	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Freeze-thaw Cycles	2	1	1	1	1	2	3	3	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Drought	2	1	1	1	1	3	3	3	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
Dixie Creek flood protection berm, lake/river dams	Freeze-thaw Cycles	2	1	1	1	1	2	3	3	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Extreme precipitation	4	1	1	1	1	3	2	3	3	–	–	–	–	M16	H7	–	- Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Incorporate climate change projections into water management plans including the Dixie Creek Berm for the proposed site. - Design water management infrastructure components to consider extreme rainfall under future climate projections. Design - Review the water balance periodically and update site-wide water balance as operations progress. Adjust accordingly	- Water management system infrastructure will be designed and maintained to be resilient to future extreme precipitation events and flooding.	Considered Resilient to Climate Change Post-Treatment.
	Flooding	4	1	1	1	1	4	4	4	4	–	–	–	–	M16	H4	–	- Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Incorporate climate change projections into water management plans including the Dixie Creek Berm for the proposed site. - Design water management infrastructure components to consider extreme rainfall under future climate projections. Design - Review the water balance periodically and update site-wide water balance as operations progress. Adjust accordingly	- Water management system infrastructure will be designed and maintained to be resilient to future extreme precipitation events and flooding.	Considered Resilient to Climate Change Post-Treatment.
	High Winds	2	1	1	1	1	1	1	2	2	–	–	–	–	L23	L21	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Extreme precipitation	4	1	1	1	1	3	2	3	3	–	–	–	–	M16	H7	–	- Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Incorporate climate change projections into water management plans including the Dixie Creek Berm for the proposed site. - Design water management infrastructure components to consider extreme rainfall under future climate projections. Design - Review the water balance periodically and update site-wide water balance as operations progress. Adjust accordingly	- Water management system infrastructure will be designed and maintained to be resilient to future extreme precipitation events and l flooding.	Considered Resilient to Climate Change Post-Treatment.

Infrastructure Category	Infrastructure Component	Climate Hazard	Confidence Level	Interaction Description	Consequence Ratings – Dollar Impact				Consequence Ratings – Licence to Operate						Consequence Ratings – Safety		Max. Consequence Score	SSP1-2.6 Current	SSP2-4.5 Current	SSP5-8.5 Current	Max Likelihood Current	SSP1-2.6 2050s	SSP2-4.5 2050s	SSP5-8.5 2050s	Max Likelihood 2050s	SSP1-2.6 2080s	SSP2-4.5 2080s	SSP5-8.5 2080s	Max Likelihood 2080s	Risk Score Current	Risk Score (2050s)	Risk Score (2080s)	Potential Treatment	Expected Treatment Impact	Resilient Statement
					Dollar Impact (revenue, cost, project budget, value)	Justification	Project Schedule Delay	Justification	Indigenous Peoples and Stakeholder Relations & Reputation (Operations)	Justification	Indigenous Peoples and Stakeholder Relations & Reputation (Corporate)	Justification	Environment	Justification	Health and Safety	Justification		Likelihood Score	Likelihood Score	Likelihood Score		Likelihood Score	Likelihood Score	Likelihood Score		Likelihood Score	Likelihood Score	Likelihood Score							
	Unnamed Watercourse 6B Diversion Ditch, Contact water collection ditches, Contact water management ponds, culverts	Flooding	Likely / High Confidence	Flooding could cause increased water on site, leading to overwhelming of culverts and ditches, with potential for erosion.	2	Potentially minor costs associated with environmental remediation	2	Repair and replacement after flooding may take more than 2 weeks	3	May lead to moderate opposition on water management - Bad publicity in case of environmental contamination	3	Potentially major loss of confidence depending environmental remediation and due to inadequate water facility design	4	Potential overflowing of mine impacted waters	3	May cause severe injuries if exposed to hazardous products	4	1	1	1	1	4	4	4	4	–	–	–	–	M16	H4	–	- Water management and monitoring plans will be developed inclusive of climate change considerations as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Incorporate climate change projections into water management plans including the Dixie Creek Berm for the proposed site. - Design water management infrastructure components to consider extreme rainfall under future climate projections. Design - Review the water balance periodically and update site-wide water balance as operations progress. Adjust accordingly	- Water management system infrastructure will be designed and maintained to be resilient to future extreme precipitation events and flooding.	Considered Resilient to Climate Change Post-Treatment.
		High Winds	Low Confidence	High winds could cause debris in ditches and culverts on site (i.e. vegetation debris and site material debris), which could increase chance of overwhelming, and cause need for maintenance to clear ditches and culverts.	1	Incidental event; Maintenance probably included in the budget	1	Regular maintenance	1	Should not impact production and be dealt internally	2	May lead to minor loss of confidence due to inadequate design or maintenance	1	Minor incident; no cleanup	1	Near miss	2	1	1	1	1	1	1	2	2	–	–	–	–	L23	L21	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	On-site well (potential well established from AEX program) and potable water treatment plant	Freeze-thaw Cycles	Low Confidence	Freeze-thaw cycles could increase damage to well infrastructure, causing need for repair and replacement.	1	Incidental event; Maintenance probably included in the budget	1	Likely no impact on production	1	Should not impact production and be dealt internally	2	May lead to minor loss of confidence due to inadequate design or maintenance	1	Minor incident; no cleanup	1	Near miss	2	1	1	1	1	2	3	3	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could cause flooding of well which could cause damage.	1	Incidental event; Maintenance probably included in the budget	1	Likely no impact on production	1	Should not impact production and be dealt internally	2	May lead to minor loss of confidence due to inadequate design or maintenance	1	Minor incident; no cleanup	1	Near miss	2	1	1	1	1	3	2	3	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Drought	Medium Confidence	Drought causes water scarcity and could impact successful functioning of well.	1	Incidental event	1	Likely no impact on production	1	Should not impact production and be dealt internally	2	May lead to minor loss of confidence due to inadequate water analysis or management	1	Minor incident; no cleanup	1	Near miss	2	1	1	1	1	3	3	3	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Domestic sewage treatment plant	Freeze-thaw Cycles	Low Confidence	Freeze-thaw cycles could damage sewage infrastructure, which could lead to increased need for repair, maintenance and possible replacement.	1	Incidental event; Maintenance probably included in the budget	1	Likely no impact on production	1	Should not impact production and be dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	1	Near miss	1	1	1	1	1	2	3	3	3	–	–	–	–	L25	L22	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could pose risks of flooding, leading to release of grey water.	2	Damage from flooding on treatment plant and from grey water spillage might be of a wider scale and potentially lead to minor costs	2	Grey water contamination management and repairs in case of flooding may lead to delay of more than 2 weeks	3	Bad publicity in case of environmental contamination	3	May lead to moderate loss of confidence due to inadequate water analysis and management, especially if it leads to environmental contamination	3	Leak or spill leading to environmental damage	3	May cause severe injuries if exposed to hazardous products	3	1	1	1	1	3	2	3	3	–	–	–	–	M17	M12	–	- Water management and monitoring plans will be developed inclusive of climate change as the Project progresses, these will include adaptive management measures. Adaptive management is a planned and systematic process for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. It provides flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation or modify exiting measures. - Continually update to best management and maintenance programs for water management infrastructure throughout operations.	- Consideration of future climate conditions into water treatment containment infrastructure will provide resilience to extreme events. - Implementation of best practice measures for integrated water management system infrastructure will adapt to future risks to treatment plant / pumping infrastructure, and other water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme Snowfall	Likely / High Confidence	Extreme snowfall could damage domestic sewage treatment plant, causing need for repair and replacement.	1	Damage from flooding on treatment plant and from grey water contamination might be of a wider scale and potentially lead to minor costs	1	Likely no impact on production	1	Should not impact production and be dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	1	Near miss	1	1	1	1	1	3	3	2	3	–	–	–	–	L25	L22	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Freezing Rain	Low Confidence	Freezing rain could damage domestic sewage treatment plant, causing need for repair and replacement.	1	Incidental event; Maintenance probably included in the budget	1	Likely no impact on production	1	Should not impact production and be dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	1	Near miss	1	1	1	1	1	3	2	3	3	–	–	–	–	L25	L22	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Drought	Medium Confidence	Drought could contribute to water scarcity, impacting sewage treatment.	1	Incidental event	1	Likely no impact on production	1	Should not impact production and be dealt internally	2	May lead to minor loss of confidence due to inadequate water analysis or management	1	Minor incident; no cleanup	1	Near miss	2	1	1	1	1	3	3	3	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for integrated water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Wildfires	Medium Confidence	In the case that a wildfire goes through the site, it could damage the sewage treatment plant, possibly causing a release of grey water.	2	Damage by wildfire on treatment plant might be of a wider scale and potentially lead to minor costs	2	Replacement/repair and grey water management in the event of fire may take more than 2 weeks	2	Low impact on production and impact dealt internally	3	Potential moderate loss of confidence depending on emergency management	3	Leak or spill leading to environmental damage	3	May cause severe injuries if exposed to hazardous products	3	3	3	3	3	3	3	3	3	–	–	–	–	M12	M12	–	- Continually update to best management and maintenance programs for water management infrastructure throughout operations.	- Implementation of best practice measures for integrated water management system infrastructure will adapt to future risks to treatment plant / pumping infrastructure, and other water management infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Natural gas pipeline and power generating facility (onsite above ground service connections)	Extreme heat	Fact	Extreme heat could impact power generation facility, causing overheating of mechanical equipment. Extreme heat could also cause pressure build up, emergency releases to avoid explosions.	1	Incidental effects on production/revenue with back-up power	1	Incidental event with back-up power	3	Potentially bad publicity and negative impact	3	Potential moderate loss of confidence depending on emergency management	3	May lead to leaks in case of explosion	3	Severe injuries in case of explosion	3	2	2	2	2	4	4	4	4	–	–	–	–	M15	M10	–	- Follow codes and practices. - Existing plans for temporary backup power supplies (e.g. diesel generators) will help reduce short-term downtimes if power supply is disrupted related to climate impacts. - Continually update to best management and maintenance programs for both grid, load management and backup power supplies during operations.	- Implementation of best practice measures for power supply infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
		Extended cold spell	Fact	Extended cold spell could cause thermal stress on pipelines, weakening components overtime. There could also be a increased frost heavy causing damage to pipeline, and confined expansion of freezing water in pipeline causing damage.	1	Incidental effects on production/revenue with back-up power	1	Incidental event with back-up power	3	Potentially bad publicity and negative impact	2	May lead to minor loss of confidence due to inadequate pipeline design and management	3	May lead to leaks	2	Minor risk with proper SME	3	1	1	1	1	2	1	2	2	–	–	–	–	M17	M15	–	- Follow codes and practices. - Existing plans for temporary backup power supplies (e.g. diesel generators) will help reduce short-term downtimes if power supply is disrupted related to climate impacts. - Continually update to best management and maintenance programs for both grid, load management and backup power supplies during operations.	- Implementation of best practice measures for power supply infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
		Freeze-thaw Cycles	Low Confidence	Increased freeze-thaw cycles could increase damage to pipelines, partly due to frost heaves, which could cause increased need for repair and maintenance.	1	Incidental effects on production/revenue with back-up power	1	Incidental event with back-up power	3	Potentially bad publicity and negative impact	2	May lead to minor loss of confidence due to inadequate pipeline design and management	3	May lead to leaks	2	Minor risk with proper SME	3	1	1	1	1	2	3	3	3	–	–	–	–	M17	M12	–	- Follow codes and practices. - Existing plans for temporary backup power supplies (e.g. diesel generators) will help reduce short-term downtimes if power supply is disrupted related to climate impacts. - Continually update to best management and maintenance programs for both grid, load management and backup power supplies during operations.	- Implementation of best practice measures for power supply infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could cause flooding, leading to damage to natural gas pipeline, which could lead to need for repair and replacement.	1	Incidental effects on production/revenue with back-up power	2	Repair and replacement after flooding may take more than 2 weeks	3	Potentially bad publicity and negative impact	2	May lead to minor loss of confidence due to inadequate water analysis or management	3	May lead to leaks	2	Minor risk with proper SME	3	1	1	1	1	3	2	3	3	–	–	–	–	M17	M12	–	- Follow codes and practices. - Existing plans for temporary backup power supplies (e.g. diesel generators) will help reduce short-term downtimes if power supply is disrupted related to climate impacts. - Continually update to best management and maintenance programs for both grid, load management and backup power supplies during operations.	- Implementation of best practice measures for power supply infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
		Flooding	Likely / High Confidence	Flooding could cause damage to natural gas pipeline, which could lead to need for repair and replacement.	1	Incidental effects on production/revenue with back-up power	2	Repair and replacement after flooding may take more than 2 weeks	3	Potentially bad publicity and negative impact	2	May lead to minor loss of confidence due to inadequate water analysis or management	3	May lead to leaks	2	Minor risk with proper SME	3	1	1	1	1	4	4	4	4	–	–	–	–	M17	M10	–	- Follow codes and practices. - Existing plans for temporary backup power supplies (e.g. diesel generators) will help reduce short-term downtimes if power supply is disrupted related to climate impacts. - Continually update to best management and maintenance programs for both grid, load management and backup power supplies during operations.	- Implementation of best practice measures for power supply infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
		Extreme Snowfall	Likely / High Confidence	Extreme snowfall could increase snow load on pipeline structures, which can stress system and lead to failure. Need for repair and replacement would occur.	1	Incidental effects on production/revenue with back-up power	1	Incidental event with back-up power	3	Potentially bad publicity and negative impact	2	May lead to minor loss of confidence due to inadequate pipeline design and management	3	May lead to leaks	2	Minor risk with proper SME	3	1	1	1	1	3	3	2	3	–	–	–	–	M17	M12	–	- Follow codes and practices. - Existing plans for temporary backup power supplies (e.g. diesel generators) will help reduce short-term downtimes if power supply is disrupted related to climate impacts. - Continually update to best management and maintenance programs for both grid, load management and backup power supplies during operations.	- Implementation of best practice measures for power supply infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.

Infrastructure Category	Infrastructure Component	Climate Hazard	Confidence Level	Interaction Description	Consequence Ratings – Dollar Impact: Dollar Impact (revenue, cost, project budget, value)	Justification	Project Schedule Delay	Justification	Licence to Operate: Indigenous Peoples and Stakeholder Relations & Reputation (Operations)	Justification	Indigenous Peoples and Stakeholder Relations & Reputation (Corporate)	Justification	Environment	Justification	Safety: Health and Safety	Justification	Max. Consequence Score	Current SSP1-2.6 Likelihood Score	Current SSP2-4.5 Likelihood Score	Current SSP5-8.5 Likelihood Score	Max Likelihood Current	2050s SSP1-2.6 Likelihood Score	2050s SSP2-4.5 Likelihood Score	2050s SSP5-8.5 Likelihood Score	Max Likelihood 2050s	2080s SSP1-2.6 Likelihood Score	2080s SSP2-4.5 Likelihood Score	2080s SSP5-8.5 Likelihood Score	Max Likelihood 2080s	Risk Score Current	Risk Score (2050s)	Risk Score (2080s)	Potential Treatment	Expected Treatment Impact	Resilient Statement
Power Supply		Wildfires	Medium Confidence	Wildfire could damage pipelines, causing release of gas and need for repair and replacement.	4	Potential high cost due to important damage in case of explosion; Difficulty of access	4	Potential long-term loss of operations	3	Potentially bad publicity due to health and safety issues	3	Potential moderate loss of confidence depending on emergency management	3	May lead to leaks in case of explosion	3	May lead to a severe injury	3	3	3	3	3	3	3	3	3	–	–	–	–	M12	H7	–	- Consider climate change projections for building design for the proposed site. - Follow codes and practices. - Existing plans for temporary backup power supplies (e.g. diesel generators) will help reduce short-term downtimes if power supply is disrupted related to climate impacts. - Continually update to best management and maintenance programs for both grid, load management and backup power supplies during operations. - Insurance policy for site to include extreme events where appropriate.	- Implementation of best practice measures for power supply infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Power line, substations and power distribution (onsite)	Increasing temperature	Fact	Increased temperature could increase growth of vegetation, increasing chance of contact with transmission line, which could cause damage, outages, and safety hazards.	1	Incidental effects on revenue for increased maintenance	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	2	Minor risk with proper SME and safety plans	2	1	1	1	1	4	4	4	4	–	–	–	–	L23	M14	–	- Follow codes and practices. - Existing plans for temporary backup power supplies (e.g. diesel generators) will help reduce short-term downtimes if power supply is disrupted related to climate impacts. - Continually update to best management and maintenance programs for both grid, load management and backup power supplies during operations.	- Implementation of best practice measures for power supply infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Power line, substations and power distribution (onsite)	Extreme heat	Fact	Extreme heat could impact functioning of the transmission line, could also contribute to degradation of foundation structures (i.e. concrete materials)	1	Reduced power over the extreme heat event may lead to minor impact on the production/revenue	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	2	Minor risk with proper SME and safety plans	2	2	2	2	2	4	4	4	4	–	–	–	–	L21	M14	–	- Follow codes and practices. - Existing plans for temporary backup power supplies (e.g. diesel generators) will help reduce short-term downtimes if power supply is disrupted related to climate impacts. - Continually update to best management and maintenance programs for both grid, load management and backup power supplies during operations.	- Implementation of best practice measures for power supply infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Power line, substations and power distribution (onsite)	Freeze-thaw Cycles	Low Confidence	Increased freeze-thaw cycles could contribute to degradation of foundation structures.	1	Incidental effects on revenue for increased maintenance	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	1	Near miss	1	1	1	1	1	2	3	3	3	–	–	–	–	L25	L22	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for power supply infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Power line, substations and power distribution (onsite)	Extreme precipitation	Likely / High Confidence	Extreme precipitation could cause flooding and damage to transmission lines, leading to power outages.	2	Replacement/repair of transmission lines may lead to minor costs; Power outages would also affect production/revenue	2	Replacement/repair of transmission lines in case of flooding may take more than 2 weeks	2	Loss of production may cause opposition	2	May lead to minor loss of confidence due to inadequate water analysis or management	1	Minor incident; no cleanup	3	Severe injuries linked to potential electrocution	3	1	1	1	1	3	2	3	3	–	–	–	–	M17	M12	–	- Follow codes and practices. - Existing plans for temporary backup power supplies (e.g. diesel generators) will help reduce short-term downtimes if power supply is disrupted related to climate impacts. - Continually update to best management and maintenance programs for both grid, load management and backup power supplies during operations.	- Implementation of best practice measures for power supply infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Power line, substations and power distribution (onsite)	Flooding	Likely / High Confidence	Flooding could contribute to damage to foundation of transmission lines, which could cause increased need for repair and maintenance.	2	Replacement/repair of transmission lines may lead to minor costs; Power outages would also affect production/revenue	2	Replacement/repair of transmission lines in case of flooding may take more than 2 weeks	2	Loss of production may cause opposition	2	May lead to minor loss of confidence due to inadequate water analysis or management	1	Minor incident; no cleanup	3	Severe injuries linked to potential electrocution	3	1	1	1	1	4	4	4	4	–	–	–	–	M17	M10	–	- Follow codes and practices. - Existing plans for temporary backup power supplies (e.g. diesel generators) will help reduce short-term downtimes if power supply is disrupted related to climate impacts. - Continually update to best management and maintenance programs for both grid, load management and backup power supplies during operations.	- Implementation of best practice measures for power supply infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Power line, substations and power distribution (onsite)	Extreme Snowfall	Likely / High Confidence	Extreme snowfall could cause damage to transmission lines, resulting in power outages.	2	Replacement/repair of transmission lines may lead to minor costs; Power outages would also affect production/revenue	2	Replacement/repair of transmission lines in case of a major storm may take more than 2 weeks	2	Loss of production may cause opposition	2	May lead to minor loss of confidence due to inadequate design	1	Minor incident; no cleanup	2	Minor risk with proper SME and safety plans	2	1	1	1	1	3	3	2	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for power supply infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Power line, substations and power distribution (onsite)	Freezing Rain	Low Confidence	Freezing rain could cause damage to transmission lines, resulting in power outages.	2	Replacement/repair of transmission lines may lead to minor costs; Power outages would also affect production/revenue	2	Replacement/repair of transmission lines in case of a major storm may take more than 2 weeks	2	Loss of production may cause opposition	2	May lead to minor loss of confidence due to inadequate design	1	Minor incident; no cleanup	2	Minor risk with proper SME and safety plans	2	1	1	1	1	3	2	3	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for power supply infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Power line, substations and power distribution (onsite)	High Winds	Low Confidence	High winds could cause damage to transmission lines resulting in power outages.	2	Replacement/repair of transmission lines may lead to minor costs; Power outages would also affect production/revenue	2	Replacement/repair of transmission lines in case of a major storm may take more than 2 weeks	2	Loss of production may cause opposition	2	May lead to minor loss of confidence due to inadequate design	1	Minor incident; no cleanup	2	Minor risk with proper SME and safety plans	2	1	1	1	1	3	2	3	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for power supply infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Power line, substations and power distribution (onsite)	Wildfires	Medium Confidence	Wildfire could damage transmission lines causing an outage of power and need for replacement of transmission lines.	4	Replacement/repair of power lines and power outages may be of moderate effects on production/revenue depending on the fire damage extent	4	Potential long-term loss of operations	2	Loss of production may cause opposition	3	Potential moderate loss of confidence depending on emergency management	1	No cleanup	2	Minor to low injury with proper planning and emergency plans	3	3	3	3	3	3	3	3	3	–	–	–	–	M12	H7	–	- Consider climate change projections for building design for the proposed site. - Follow codes and practices. - Existing plans for temporary backup power supplies (e.g. diesel generators) will help reduce short-term downtimes if power supply is disrupted related to climate impacts. - Continually update to best management and maintenance programs for both grid, load management and backup power supplies during operations. - Insurance policy for site to include extreme events where appropriate.	- Implementation of best practice measures for power supply infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Site roads, Haul roads, laydown and parking areas (gravel)	Extended cold spell	Fact	Extended cold spells could cause increased frost penetration and cause damage to roads, with increased need for maintenance and repair.	1	Potential very low cost involved due to road management	1	Incidental event with relatively easy/rapid management measures	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	1	Near miss	1	1	1	1	1	2	1	2	2	–	–	–	–	L25	L24	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for roads.	Considered Resilient to Climate Change Post-Treatment.
	Site roads, Haul roads, laydown and parking areas (gravel)	Evapotranspiration	Medium Confidence	Evapotranspiration could lead to increased drying of road, causing dust, which impacts health and safety and could cause need for dust suppressant materials.	1	Potential costs for legal and financial penalties, health-related issues and air quality management	1	Temporary shutdown from community opposition and changes in regulatory environment	2	Temporary shutdown/operational disruption and negative impact	2	Low effects on strategy and decision making	3	May lead to legal and financial penalties	2	May cause minor injuries linked to dust (to a lower level than dust from hazardous materials)	3	1	1	1	1	1	2	3	3	–	–	–	–	M17	M12	–	- Consider climate change projections into road design for the proposed site. - Follow codes and practices. - Implement fugitive dust best practices and continual monitoring of dust conditions throughout operations. - Continually update to best management and maintenance programs for roads management during operations.	- Consideration of future climate conditions into roads infrastructure will provide resilience to extreme events. - Implementation of best practice measures for roads infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Site roads, Haul roads, laydown and parking areas (gravel)	Freeze-thaw Cycles	Low Confidence	Increased freeze-thaw cycles could contribute to rutting and potholes in gravel roads, causing increased maintenance needs.	1	Potential very low cost involved due to road management	1	Incidental event with relatively easy/rapid management measures	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	1	Near miss	1	1	1	1	1	2	3	3	3	–	–	–	–	L25	L22	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for roads.	Considered Resilient to Climate Change Post-Treatment.
	Site roads, Haul roads, laydown and parking areas (gravel)	Extreme precipitation	Likely / High Confidence	Extreme precipitation could lead to increased erosion on gravel roads leading to road washouts and access issues on site.	1	Potential very low cost involved due to road management (probably included in the budget)	2	Replacement/repair of roads in the event of flooding may take more than 2 weeks	2	Loss of production may create opposition	2	May lead to minor loss of confidence due to inadequate water analysis or management	1	Minor incident; no cleanup	2	Hazardous transport conditions can lead to minor injuries	2	1	1	1	1	3	2	3	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for roads.	Considered Resilient to Climate Change Post-Treatment.
	Site roads, Haul roads, laydown and parking areas (gravel)	Flooding	Likely / High Confidence	Flooding could lead to increased erosion on gravel roads leading to road washouts and access issues on site.	1	Potential very low cost involved due to road management (probably included in the budget)	2	Replacement/repair of roads in the event of flooding may take more than 2 weeks	2	Loss of production may create opposition	2	May lead to minor loss of confidence due to inadequate water analysis or management	1	Minor incident; no cleanup	2	Hazardous transport conditions can lead to minor injuries	2	1	1	1	1	4	4	4	4	–	–	–	–	L23	M14	–	- Consider climate change projections into road design for the proposed site. - Follow codes and practices. - Implement fugitive dust best practices and continual monitoring of dust conditions throughout operations. - Continually update to best management and maintenance programs for roads management during operations.	- Consideration of future climate conditions into roads infrastructure will provide resilience to extreme events. - Implementation of best practice measures for roads infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Site roads, Haul roads, laydown and parking areas (gravel)	Extreme Snowfall	Likely / High Confidence	Extreme snowfall could cause heavy snow loading on roads, causing site access issues.	1	Potential very low cost involved due to road management/snow and ice management (probably included in the budget)	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	2	Hazardous transport conditions can lead to minor injuries	2	1	1	1	1	3	3	2	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for roads.	Considered Resilient to Climate Change Post-Treatment.
	Site roads, Haul roads, laydown and parking areas (gravel)	Freezing Rain	Low Confidence	Freezing rain could cause heavy ice load on roads, causing site access issues.	1	Potential very low cost involved due to road management/snow and ice management (probably included in the budget)	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	2	Hazardous transport conditions can lead to minor injuries	2	1	1	1	1	3	2	3	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for roads.	Considered Resilient to Climate Change Post-Treatment.
	Site roads, Haul roads, laydown and parking areas (gravel)	Drought	Medium Confidence	Drought conditions could cause increased dust on roads, causing health and safety concerns and increasing needs for dust management measures	1	Potential costs for legal and financial penalties, health-related issues and air quality management	1	Temporary shutdown from community opposition and changes in regulatory environment	3	Temporary shutdown/operational disruption and negative impact	3	Low effects on strategy and decision making	3	May lead to legal and financial penalties	2	May cause minor injuries linked to dust (to a lower level than dust from hazardous materials)	3	1	1	1	1	3	3	3	3	–	–	–	–	M17	M12	–	- Consider climate change projections into road design for the proposed site. - Follow codes and practices. - Implement fugitive dust best practices and continual monitoring of dust conditions throughout operations. - Continually update to best management and maintenance programs for roads management during operations.	- Consideration of future climate conditions into roads infrastructure will provide resilience to extreme events. - Implementation of best practice measures for roads infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.

Infrastructure Category	Infrastructure Component	Climate Hazard	Confidence Level	Interaction Description	Consequence Ratings – Dollar Impact: Dollar Impact (revenue, cost, project budget, value)	Justification	Project Schedule Delay	Justification	Licence to Operate: Indigenous Peoples and Stakeholder Relations & Reputation (Operations)	Justification	Indigenous Peoples and Stakeholder Relations & Reputation (Corporate)	Justification	Environment	Justification	Safety: Health and Safety	Justification	Max. Consequence Score	Current SSP1-2.6 Likelihood Score	Current SSP2-4.5 Likelihood Score	Current SSP5-8.5 Likelihood Score	Max Likelihood Current	2050s SSP1-2.6 Likelihood Score	2050s SSP2-4.5 Likelihood Score	2050s SSP5-8.5 Likelihood Score	Max Likelihood 2050s	2080s SSP1-2.6 Likelihood Score	2080s SSP2-4.5 Likelihood Score	2080s SSP5-8.5 Likelihood Score	Max Likelihood 2080s	Risk Score Current	Risk Score (2050s)	Risk Score (2080s)	Potential Treatment	Expected Treatment Impact	Resilient Statement
Roads		High Winds	Low Confidence	High winds could cause debris on site roads, causing access issues and increased effort is keeping roads clear and maintained	1	Potential very low cost involved due to road management (probably included in the budget)	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	2	Hazardous transport conditions can lead to minor injuries	2	1	1	1	1	1	1	2	2	–	–	–	–	L23	L21	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for roads.	Considered Resilient to Climate Change Post-Treatment.
		Wildfires	Medium Confidence	Wildfire could impact site road access, and cause roads to become impassible with debris.	2	Potentially minor costs associated with road management and fire protection management (i.e. making trenches)	2	Replacement/repair of roads in the event of fire may take more than 2 weeks	2	Loss of production may create opposition	3	Potential moderate loss of confidence depending on emergency management	1	Minor incident; no cleanup	2	Minor to low injury with proper planning and emergency plans	3	3	3	3	3	3	3	3	3	–	–	–	–	M12	M12	–	- Consider climate change projections into road design for the proposed site. - Follow codes and practices. - Implement fugitive dust best practices and continual monitoring of dust conditions throughout operations. - Continually update to best management and maintenance programs for roads management during operations.	- Consideration of future climate conditions into roads infrastructure will provide resilience to extreme events. - Implementation of best practice measures for roads infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Offsite roads	Extreme heat	Fact	Extreme heat could lead to softening of pavement, causing rutting in pavement and increased need for maintenance.	1	Cost probably shared and within planned budget for road maintenance	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	1	Near miss	1	2	2	2	2	4	4	4	4	–	–	–	–	L24	L20	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for roads.	Considered Resilient to Climate Change Post-Treatment.
	Offsite roads	Extended cold spell	Fact	Extended cold spells could cause increased frost penetration and cause damage to roads, with increased need for maintenance and repair.	1	Cost probably shared and within planned budget for road maintenance	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	1	Near miss	1	1	1	1	1	2	1	2	2	–	–	–	–	L25	L24	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for roads.	Considered Resilient to Climate Change Post-Treatment.
	Offsite roads	Freeze-thaw Cycles	Low Confidence	Increased freeze-thaw cycles could cause damage to pavement, including cracked pavement and ruts, causing increased need for maintenance.	1	Cost probably shared and within planned budget for road maintenance	1	Incidental event	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	1	Near miss	1	1	1	1	1	2	3	3	3	–	–	–	–	L25	L22	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for roads.	Considered Resilient to Climate Change Post-Treatment.
	Offsite roads	Extreme precipitation	Likely / High Confidence	Extreme precipitation could cause erosion on edges of pavement, causing pavement edges to break off. This can increase need for maintenance and repair. This could also cause flooding issues, leading to access issues to suite.	1	Cost probably shared and within planned budget for road maintenance	2	Repair and replacement after flooding may take more than 2 weeks	2	Loss of production may cause opposition	2	May lead to minor loss of confidence due to inadequate water analysis or management	1	Minor incident; no cleanup	1	Near miss	2	1	1	1	1	3	2	3	3	–	–	–	–	L23	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for roads.	Considered Resilient to Climate Change Post-Treatment.
	Offsite roads	Flooding	Likely / High Confidence	Flooding could cause access issues to site. This could also cause erosion and damage to roads, leading to need for maintenance and repair.	1	Cost probably shared and within planned budget for road maintenance	2	Repair and replacement after flooding may take more than 2 weeks	2	Loss of production may cause opposition	2	May lead to minor loss of confidence due to inadequate water analysis or management	1	Minor incident; no cleanup	1	Near miss	2	1	1	1	1	4	4	4	4	–	–	–	–	L23	M14	–	- Consider climate change projections into road design for the proposed site. - Follow codes and practices. - Implement fugitive dust best practices and continual monitoring of dust conditions throughout operations. - Continually update to best management and maintenance programs for roads management during operations.	- Consideration of future climate conditions into roads infrastructure will provide resilience to extreme events. - Implementation of best practice measures for roads infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Offsite roads	Extreme Snowfall	Likely / High Confidence	Extreme snowfall could cause heavy snow loading on roads, causing site access issues.	1	Cost probably shared and within planned budget for road maintenance	1	Incidental event; snow plowing should take less than 2 weeks	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	3	Hazardous driving conditions can lead to major injuries	3	1	1	1	1	3	3	2	3	–	–	–	–	M17	M12	–	- Consider climate change projections into road design for the proposed site. - Follow codes and practices. - Implement fugitive dust best practices and continual monitoring of dust conditions throughout operations. - Continually update to best management and maintenance programs for roads management during operations.	- Consideration of future climate conditions into roads infrastructure will provide resilience to extreme events. - Implementation of best practice measures for roads infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Offsite roads	Freezing Rain	Low Confidence	Freezing rain could cause heavy ice load on roads, causing site access issues.	1	Cost probably shared and within planned budget for road maintenance	1	Incidental event; de-icing should take less than 2 weeks	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	3	Hazardous driving conditions can lead to major injuries	3	1	1	1	1	3	2	3	3	–	–	–	–	M17	M12	–	- Consider climate change projections into road design for the proposed site. - Follow codes and practices. - Implement fugitive dust best practices and continual monitoring of dust conditions throughout operations. - Continually update to best management and maintenance programs for roads management during operations.	- Consideration of future climate conditions into roads infrastructure will provide resilience to extreme events. - Implementation of best practice measures for roads infrastructure will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Offsite roads	High Winds	Low Confidence	High winds could cause debris on site roads, causing access issues and increased effort is keeping roads clear and maintained	1	Cost probably shared and within planned budget for road maintenance	1	Incidental event; de-icing should take less than 2 weeks	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	2	Hazardous driving conditions can lead to minor injuries	2	1	1	1	1	1	1	2	2	–	–	–	–	L23	L21	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for roads.	Considered Resilient to Climate Change Post-Treatment.
	Offsite roads	Wildfires	Medium Confidence	Wildfire could impact site road access, and cause roads to become impassible with debris.	1	Cost probably shared and within planned budget for road maintenance	1	Incidental event; de-icing should take less than 2 weeks	1	Very low impact on production and impact dealt internally	1	Likely no impact on confidence	1	Minor incident; no cleanup	2	Minor to low injury with proper planning and emergency plans	2	3	3	3	3	3	3	3	3	–	–	–	–	L19	L19	–	- Include as part of Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for roads.	Considered Resilient to Climate Change Post-Treatment.
Fish Compensation Areas	Fish Compensation Areas	Extreme heat	Fact	Extreme heat could affect water temperatures thereby impacting the health of the fish.	2	Some cost implications if the fish compensation areas need adjustments / improvements.	1	Minor impacts to schedule if adjustments/improvements are required.	2	Impacts to fish compensation could result in some stakeholder concerns.	2	Impacts to fish compensation could result in some stakeholder concerns.	3	Minor incident resulting in a fine or written warning. Some remediation required	1	Low impact on health and safety.	3	2	2	2	2	4	4	4	4	–	–	–	–	M15	M10	–	- Select species based on their habitat preferences as per the Fish Habitat Compensation Plan. - A combination of onsite monitors, and qualified designates will monitor effectiveness and document compliance with the approved plans. - Consider climate change in species selection.	- Implementing existing procedures will manage risks and continual improvements as needed.	Considered Resilient to Climate Change Post-Treatment.
	Fish Compensation Areas	Evapotranspiration	Medium Confidence	Evapotranspiration could affect water levels with potential impacts to the fish .	2	Some cost implications if the fish compensation areas need adjustments / improvements.	1	Minor impacts to schedule if adjustments/improvements are required.	2	Impacts to fish compensation could result in some stakeholder concerns.	2	Impacts to fish compensation could result in some stakeholder concerns.	3	Minor incident resulting in a fine or written warning. Some remediation required	1	Low impact on health and safety.	3	1	1	1	1	1	2	3	3	–	–	–	–	M17	M12	–	- The detailed design for the diversion channel and reconstructed Unnamed Watercourse 6b will be informed by a detailed topographical survey to confirm grades and elevations to ensure fish passage, as well as a detailed geomorphological design to confirm and design channel diagnostics reflective of the modeled flow. - A combination of onsite monitors, and qualified designates will monitor effectiveness and document compliance with the approved plans. - Consider climate change in design	- Implementing existing procedures will manage risks and continual improvements as needed.	Considered Resilient to Climate Change Post-Treatment.
	Fish Compensation Areas	Flooding	Likely / High Confidence	Flooding out of water could have potential detrimental impacts to the health of fish.	2	Some cost implications if the fish compensation areas need adjustments / improvements.	1	Minor impacts to schedule if adjustments/improvements are required.	2	Impacts to fish compensation could result in some stakeholder concerns.	2	Impacts to fish compensation could result in some stakeholder concerns.	3	Minor incident resulting in a fine or written warning. Some remediation required	1	Low impact on health and safety.	3	1	1	1	1	4	4	4	4	–	–	–	–	M17	M10	–	- The detailed design for the diversion channel and reconstructed Unnamed Watercourse 6b will be informed by a detailed topographical survey to confirm grades and elevations to ensure fish passage, as well as a detailed geomorphological design to confirm and design channel diagnostics reflective of the modeled flow. - A combination of onsite monitors, and qualified designates will monitor effectiveness and document compliance with the approved plans. - Consider climate change in design	- Implementing existing procedures will manage risks and continual improvements as needed.	Considered Resilient to Climate Change Post-Treatment.
	Fish Compensation Areas	Extreme precipitation	Likely / High Confidence	Extreme precipitation could cause erosion of edges of unnamed water bodies that are planned for fish habitat. This could reduce quality of habitat.	2	Some cost implications if the fish compensation areas need adjustments / improvements.	1	Minor impacts to schedule if adjustments/improvements are required.	2	Impacts to fish compensation could result in some stakeholder concerns.	2	Impacts to fish compensation could result in some stakeholder concerns.	3	Minor incident resulting in a fine or written warning. Some remediation required	1	Low impact on health and safety.	3	1	1	1	1	3	2	3	3	–	–	–	–	M17	M12	–	- The detailed design for the diversion channel and reconstructed Unnamed Watercourse 6b will be informed by a detailed topographical survey to confirm grades and elevations to ensure fish passage, as well as a detailed geomorphological design to confirm and design channel diagnostics reflective of the modeled flow. - A combination of onsite monitors, and qualified designates will monitor effectiveness and document compliance with the approved plans. - Consider climate change in design	- Implementing existing procedures will manage risks and continual improvements as needed.	Considered Resilient to Climate Change Post-Treatment.
	Fish Compensation Areas	Drought	Medium Confidence	Drought could result in reduced water levels with potential impacts to the health of the fish.	2	Some cost implications if the fish compensation areas need adjustments / improvements.	1	Minor impacts to schedule if adjustments/improvements are required.	2	Impacts to fish compensation could result in some stakeholder concerns.	2	Impacts to fish compensation could result in some stakeholder concerns.	3	Minor incident resulting in a fine or written warning. Some remediation required	1	Low impact on health and safety.	3	1	1	3	3	3	3	3	3	–	–	–	–	M17	M12	–	- The detailed design for the diversion channel and reconstructed Unnamed Watercourse 6b will be informed by a detailed topographical survey to confirm grades and elevations to ensure fish passage, as well as a detailed geomorphological design to confirm and design channel diagnostics reflective of the modeled flow. - A combination of onsite monitors, and qualified designates will monitor effectiveness and document compliance with the approved plans. - Consider climate change in design	- Implementing existing procedures will manage risks and continual improvements as needed.	Considered Resilient to Climate Change Post-Treatment.
	Fish Compensation Areas	Wildfires	Medium Confidence	Wildfire could cause vegetation in habitat to die off, which. Could require revegetation. Debris from the wildfire could also impact the quality of habitat.	1	Some cost implications if revegetation or if the fish compensation areas need adjustments / improvements.	1	Minor impacts to schedule if adjustments/improvements are required.	2	Impacts to fish compensation could result in some stakeholder concerns.	2	Impacts to fish compensation could result in some stakeholder concerns.	2	Minor incident with potential for some remediation required	1	Low impact on health and safety.	2	3	3	3	3	3	3	3	3	–	–	–	–	L19	L19	–	- A combination of onsite monitors, and qualified designates will monitor effectiveness and document compliance with the approved plans. - Consider climate change in species selection.	- Implementing existing procedures will manage risks and continual improvements as needed.	Considered Resilient to Climate Change Post-Treatment.
	Secured openings, backfilled portals, shaft caps	Extreme heat	Fact	Extreme heat could cause degradation of shaft caps (if made on concrete).	1	It is assumed that to repair a degraded shaft cap there would be less than 1% dollar impact.	1	degraded shaft cap could cause no significant project delay (<2 weeks).	1	degraded chat cap would not impact and reputation as this would likely stay internal.	1	Degraded shaft cap would not impact and reputation as this would likely stay at the site level.	1	Minor incident; no cleanup	2	Degradation could cause possible worker safety concern around shaft possibly causing minor injury	2	–	–	–	–	–	–	–	–	4	5	5	5	–	–	M11	- Continually update to best management and maintenance programs for water management and other infrastructure during post-closure design and into post-closure.	- Implementation of best practice measures for post-closure activities will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Secured openings, backfilled portals, shaft caps	Freeze-thaw Cycles	Low Confidence	Freeze-thaw cycles could damage shaft caps (if made of concrete)	1	It is assumed that to repair a degraded shaft cap there would be less than 1% dollar impact.	1	degraded shaft cap could cause no significant project delay (<2 weeks).	1	degraded shaft cap would not impact and reputation as this would likely stay internal.	1	Degraded shaft cap would not impact and reputation as this would likely stay at the site level.	1	Minor incident; no cleanup	2	Degradation could cause possible worker safety concern around shaft possibly causing minor injury	2	–	–	–	–	–	–	–	–	3	3	3	3	–	–	L19	- Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.

Infrastructure Category	Infrastructure Component	Climate Hazard	Confidence Level	Interaction Description	Consequence Ratings – Dollar Impact: Dollar Impact (revenue, cost, project budget, value)	Justification	Project Schedule Delay	Justification	Licence to Operate: Indigenous Peoples and Stakeholder Relations & Reputation (Operations)	Justification	Indigenous Peoples and Stakeholder Relations & Reputation (Corporate)	Justification	Environment	Justification	Safety: Health and Safety	Justification	Max. Consequence Score	Current SSP1-2.6 Likelihood Score	Current SSP2-4.5 Likelihood Score	Current SSP5-8.5 Likelihood Score	Max Likelihood Current	2050s SSP1-2.6 Likelihood Score	2050s SSP2-4.5 Likelihood Score	2050s SSP5-8.5 Likelihood Score	Max Likelihood 2050s	2080s SSP1-2.6 Likelihood Score	2080s SSP2-4.5 Likelihood Score	2080s SSP5-8.5 Likelihood Score	Max Likelihood 2080s	Risk Score Current	Risk Score (2050s)	Risk Score (2080s)	Potential Treatment	Expected Treatment Impact	Resilient Statement
	Pit Lakes and construction channels, VMF	Evapotranspiration	Medium Confidence	Increased evapotranspiration could slow down filling of pit lakes, and cause water quality issues that could result in need for increased treatment requirements.	2	Water quality issues due to evapotranspiration could result in increased treatment costs and potential fines. This is a Minor dollar impact.	1	Decreased water quality in pit lakes would no cause a project delay.	2	Water quality issues on site may cause some opposition.	2	Water quality issues on site could cause limited impact on confidence in management of company.	2	Environmental impacts from pit lake water quality issues would likely stay on site and require some mitigation	2	Water quality issue on site would have incidental human health impact.	2	–	–	–	–	–	–	–	–	3	4	5	5	–	–	M8	- Use Great Bear Resources existing monitoring and reporting practices to monitor climate over the operations phase to better understand how observed changes in climate hazards and the mine infrastructure may impacting post-closure - Consider climate change projections in detailed design of post-closure infrastructure and update of interim and final closure plan. - Final Closure plan will be reviewed based on the above data.	- Post closure infrastructure will be designed and maintained to be resilient to future extreme precipitation events, flooding and dry conditions.	Considered Resilient to Climate Change Post-Treatment.
		Freeze-thaw Cycles	Low Confidence	Freeze-thaw cycles could affect the Mine Rosk Stockpiles potentially acid generating mine rock cover performance and may result in the desiccation of the clay layer resulting in cracking and an increase in oxygen ingress and decrease is seepage water quality. In addition, freeze-thaw increase, and other extreme weather events (i.e. extreme snowfall) could damage shaft caps and construction channels.	4	Freeze-thaw increase leading to desiccation of the clay layer could have major dollar impact (10-20%)	1	Damage will have no project delay	4	Failure of geochemical cover could cause strong opposition	4	Failure of geochemical cover could loss of confidence in company	5	Failure of geochemical cover could cause detrimental incident.	1	Failure of geochemical cover could will have no serious health and safety impact.	1	–	–	–	–	–	–	–	–	3	3	3	3	–	–	H5	- Use Great Bear Resources existing monitoring and reporting practices to monitor climate over the operations phase to better understand how observed changes in climate hazards and the mine infrastructure may impacting post-closure - Consider climate change projections in detailed design of post-closure infrastructure and update of interim and final closure plan. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Precipitation increase	Fact	Increased precipitation could lead to changes in groundwater which could impact soil stability, and slope stability.	1	Instability on Pit Lake slope is assumed to have incidental dollar impact.	1	Instability on Pit Lake slope is assumed to have incidental project delay.	2	In the case of instability resulting in failure, there could be some opposition.	2	In the case of instability resulting in failure, there could be some opposition.	1	Environmental impact from instable pit lake slopes would be incidental.	3	In the case of instability resulting in failure, severe injury could occur if personal are in area.	3	–	–	–	–	–	–	–	–	5	5	5	5	–	–	H6	- Use Great Bear Resources existing monitoring and reporting practices to monitor climate over the operations phase to better understand how observed changes in climate hazards and the mine infrastructure may impacting post-closure - Consider climate change projections in detailed design of post-closure infrastructure and update of interim and final closure plan. - Final Closure plan will be reviewed based on the above data.	- Post closure infrastructure will be designed and maintained to be resilient to future extreme precipitation events, flooding and dry conditions.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could lead to flooding of pit lake, which could release water through construction channel impacted by mine. Could also lead to erosion of pit walls, impacting stability.	2	Release of Pit Lake water could result in fine from release of mine impacted water.	1	Release of mine impacted water would not delay project more than 2 week (considering this is post-closure phase)	3	Release of mine impacted water from Pit Lake could result in moderate opposition due to environmental impact.	2	Release of mine impacted water from Pit Lake could result in limited impact on confidence.	3	Release of mine impacted water from Pit Lake could result in fine or written warning, with some remediation required.	2	Release of mine impacted water from Pit Lake could result in minor injury to personal on site in the case of flooding	3	–	–	–	–	–	–	–	–	3	3	4	4	–	–	M10	- Continually update to best management and maintenance programs for water management and other infrastructure during post-closure design and into post-closure.	- Implementation of best practice measures for post-closure activities will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
		Flooding	Likely / High Confidence	Flooding could cause overwhelming of construction channels, causing water to be released from channels onto site, and potentially causing damage to channels.	1	Damage to construction channels will have incidental dollar impact	1	Release of mine impacted water would not delay project more than 2 week (considering this is post-closure phase)	2	Release of water from construction channels could result in minor opposition or impact due to environmental concerns	2	Release of water from construction channels could result in minor opposition or bad publicity due to environmental impact.	1	Release of water from construction channels could result Minor incident with no clean up.	1	Release from channels on site will have no serious impact to health and safety.	2	–	–	–	–	–	–	–	–	4	5	4	5	–	–	M11	- Continually update to best management and maintenance programs for water management and other infrastructure during post-closure design and into post-closure.	- Implementation of best practice measures for post-closure activities will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
		Extreme Snowfall	Likely / High Confidence	Extreme snowfall could cause damage to construction channels, causing increased need for maintenance and repair.	1	Damage to construction channels will have incidental dollar impact	1	Damage to construction channels will have no project delay	1	Damaged construction channels will have no opposition.	1	Damaged construction channels will have no loss of confidence in company	1	Damage to construction channels will have minor environmental impact with no clean up	1	Damage to construction channels will have no serious health and safety impact.	1	–	–	–	–	–	–	–	–	3	3	3	3	–	–	L22	- Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Freezing Rain	Low Confidence	Freezing-rain could cause blockage and/or damage to construction channels	1	Damage to construction channels will have incidental dollar impact	1	Damage to construction channels will have no project delay	1	Damaged construction channels will have no opposition.	1	Damaged construction channels will have no loss of confidence in company	1	Damage to construction channels will have minor environmental impact with no clean up	1	Damage to construction channels will have no serious health and safety impact.	1	–	–	–	–	–	–	–	–	3	3	3	3	–	–	L22	- Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Drought	Medium Confidence	Drought conditions could slow filling of pit lake, and cause water quality issues.	2	Water quality issues due to drought could result in increased treatment costs and potential fines. This is a Minor dollar impact.	1	Decreased water quality in pit lakes would no cause a project delay.	2	Water quality issues on site could cause some opposition.	2	Water quality issues on site could cause limited impact on confidence in management of company.	1	Environmental impact from pit lake water quality issues would likely stay on site and require no clean up.	1	Water quality issue on site would have incidental human health impact.	2	–	–	–	–	–	–	–	–	3	3	4	4	–	–	M14	- Continually update to best management and maintenance programs for water management and other infrastructure during post-closure design and into post-closure.	- Implementation of best practice measures for post-closure activities will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
		High Winds	Low Confidence	Extreme winds could cause increased wave runup, causing a breach of water containment structures releasing some mine contaminated water on site.	1	Wave erosion on pit walls causing instability would have incidental dollar impact	1	Wave erosion on pit walls causing instability would have incidental project delay (considering it is in post-closure)	2	In the case of instability resulting in failure, there could be some opposition.	2	In the case of instability resulting in failure, there could be some opposition.	1	Environmental impact from instable pit lake slopes would be incidental.	3	In the case of instability resulting in failure, severe injury could occur if personal are in area.	3	–	–	–	–	–	–	–	–	1	1	2	2	–	–	M15	- Continually update to best management and maintenance programs for water management and other infrastructure during post-closure design and into post-closure.	- Implementation of best practice measures for post-closure activities will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Reclaimed Pit Slopes	Evapotranspiration	Medium Confidence	Increased evapotranspiration could contribute to dry conditions which could cause vegetation die off. This could cause increased chance of erosion, and pit was instability (erosion is a secondary impact here, and not considered in scoring).	1	Veg die off could cause need for revegetation, however this would have incidental dollar impact.	1	Veg die off could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off could cause need for revegetation, however this would have no impact to confidence in company.	1	vegetation die off would have incidental impact on environment.	1	vegetation die off would have incidental impact on health and safety	1	–	–	–	–	–	–	–	–	3	4	5	5	–	–	L18	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could lead to erosion on of reclaimed pit walls which to instability, with the possibility of washout and die off of pit wall vegetation.	1	Instability on Pit Lake slope is assumed to have incidental dollar impact.	1	Instability on Pit Lake slope is assumed to have incidental project delay.	2	In the case of instability resulting in failure, there could be some opposition.	2	In the case of instability resulting in failure, there could be some opposition.	1	Environmental impact from instable pit lake slopes would be incidental.	3	In the case of instability resulting in failure, severe injury could occur if personal are in area.	3	–	–	–	–	–	–	–	–	3	3	4	4	–	–	M10	- Continually update to best management and maintenance programs for water management and other infrastructure during post-closure design and into post-closure.	- Implementation of best practice measures for post-closure activities will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
		Flooding	Likely / High Confidence	In extreme cases, flooding could cause water to enter pit lake, leading to erosion on of reclaimed pit walls which to instability, with the possibility of washout and die off of pit wall vegetation.	1	Instability on Pit Lake slope is assumed to have incidental dollar impact.	1	Instability on Pit Lake slope is assumed to have incidental project delay.	2	In the case of instability resulting in failure, there could be some opposition.	2	In the case of instability resulting in failure, there could be some opposition.	1	Environmental impact from instable pit lake slopes would be incidental.	3	In the case of instability resulting in failure, severe injury could occur if personal are in area.	3	–	–	–	–	–	–	–	–	4	5	4	5	–	–	H6	- Use Great Bear Resources existing monitoring and reporting practices to monitor climate over the operations phase to better understand how observed changes in climate hazards and the mine infrastructure may impacting post-closure - Consider climate change projections in detailed design of post-closure infrastructure and update of interim and final closure plan. - Final Closure plan will be reviewed based on the above data.	- Post closure infrastructure will be designed and maintained to be resilient to future extreme precipitation events, flooding, and dry conditions.	Considered Resilient to Climate Change Post-Treatment.
		Drought	Medium Confidence	Drought conditions could cause die of re-vegetated pit slopes, causing need to re-vegetate, or increase plant maintenance.	1	Veg die off could cause need for revegetation, however this would have incidental dollar impact.	1	Veg die off could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off could cause need for revegetation, however this would have no impact to confidence in company.	1	vegetation die off would have incidental impact on environment.	1	vegetation die off would have incidental impact on health and safety	1	–	–	–	–	–	–	–	–	3	3	4	4	–	–	L20	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		High Winds	Low Confidence	High winds could impact rehabilitation plans for cover during post-closure	1	Veg die off could cause need for revegetation, however this would have incidental dollar impact.	1	Veg die off could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off could cause need for revegetation, however this would have no impact to confidence in company.	1	vegetation die off would have incidental impact on environment.	1	vegetation die off would have incidental impact on health and safety	1	–	–	–	–	–	–	–	–	4	4	4	4	–	–	L20	- Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Wildfires	Medium Confidence	Wildfire could kill off vegetation on Pit slope, leading to increased erosion, and impacting revegetation planning/natural restoration	1	Veg die off could cause need for revegetation, however this would have incidental dollar impact.	1	Veg die off could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off could cause need for revegetation, however this would have no impact to confidence in company.	1	vegetation die off would have incidental impact on environment.	1	vegetation die off would have incidental impact on health and safety	1	–	–	–	–	–	–	–	–	3	3	3	3	–	–	L22	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Reclaimed Waste Rock Storage Areas	Evapotranspiration	Medium Confidence	Evapotranspiration could contribute to dry conditions, causing die off of vegetation. This could cause the need for revegetation actions.	1	Veg die off could cause need for revegetation, however this would have incidental dollar impact.	1	Veg die off could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off could cause need for revegetation, however this would have no impact to confidence in company.	1	vegetation die off would have incidental impact on environment.	1	vegetation die off would have incidental impact on health and safety	1	–	–	–	–	–	–	–	–	3	4	5	5	–	–	L18	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could cause increased runoff from mineral waste pile, and cause erosion with potential impact to stability.	2	Increased runoff of acid and increased acid generation could cause need for intervention and possible fines, having minor dollar impact (1-5%).	1	Increased runoff of acid and increased acid generation could cause need for intervention and possible fines, having incidental project delay (considering in post-closure stage)	3	Increased runoff of acid and increased acid generation could cause need for intervention and possible fines, and increased instability and possible failure could cause moderate opposition and bad publicity.	3	Increased runoff of acid and increased acid generation could cause need for intervention and possible fines, and increased instability and possible failure could cause medium impact to confidence in company as this could cause stockpile to not work as intended.	3	Increased runoff of acid and increased acid generation could cause need for intervention and possible fines, could cause moderate environmental impact.	3	Increased instability risk and in the case of failure could cause severe injury.	3	–	–	–	–	–	–	–	–	3	3	4	4	–	–	M10	- Continually update to best management and maintenance programs for water management and other infrastructure during post-closure design and into post-closure.	- Implementation of best practice measures for post-closure activities will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
		Drought	Medium Confidence	Drought could cause die off of vegetation on mineral waste piles. This could cause need for revegetation efforts, and increase erosion, causing a potential stability risk (erosion and stability are secondary impacts here and are not considered in scoring).	1	Veg die off could cause need for revegetation, however this would have incidental dollar impact.	1	Veg die off could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off could cause need for revegetation, however this would have no impact to confidence in company.	1	vegetation die off would have incidental impact on environment.	1	vegetation die off would have incidental impact on health and safety	1	–	–	–	–	–	–	–	–	3	3	4	4	–	–	L20	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		High Winds	Low Confidence	High winds could impact rehabilitation plans for cover during post-closure	1	veg die off and wind erosion could cause need for revegetation however this could have an incidental dollar impact	1	veg die off and wind erosion could cause need for revegetation however this could have an incidental project delay (considering this is in post-closure).	1	Veg die off and wind erosion could cause need for revegetation however this could have only potential opposition.	1	veg die off and wind erosion could cause need for revegetation however this could have no real impact to confidence in company.	1	veg die off and wind erosion could cause need for revegetation however this could cause minor environmental incident with no cleanup.	1	veg die off and wind erosion could cause need for revegetation however this could cause no real health and safety impacts.	1	–	–	–	–	–	–	–	–	4	4	4	4	–	–	L20	- Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Wildfires	Medium Confidence	Wildfire could kill off vegetation on reclaims mineral waste storage areas leading to increased erosion, and impacting revegetation planning/natural restoration	1	Veg die off could cause need for revegetation, however this would have incidental dollar impact.	1	Veg die off could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off could cause need for revegetation, however this would have no impact to confidence in company.	1	vegetation die off would have incidental impact on environment.	1	vegetation die off would have incidental impact on health and safety	1	–	–	–	–	–	–	–	–	3	3	3	3	–	–	L22	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.

Infrastructure Category	Infrastructure Component	Climate Hazard	Confidence Level	Interaction Description	Consequence Ratings – Dollar Impact: Dollar Impact (revenue, cost, project budget, value)	Justification	Project Schedule Delay	Justification	Licence to Operate: Indigenous Peoples and Stakeholder Relations & Reputation (Operations)	Justification	Indigenous Peoples and Stakeholder Relations & Reputation (Corporate)	Justification	Environment	Justification	Safety: Health and Safety	Justification	Max. Consequence Score
Post-Closure	Revegetated TMF	Evapotranspiration	Medium Confidence	Evapotranspiration could cause dry conditions, which could kill off vegetation on revegetated TMF. This could cause need for revegetation efforts, and possible erosion of cover material (erosion is secondary impact and not considered in scoring)	1	Veg die off could cause need for revegetation, however this would have incidental dollar impact.	1	Veg die off could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off could cause need for revegetation, however this would have no impact to confidence in company.	1	vegetation die off would have incidental impact on environment.	1	vegetation die off would have incidental impact on health and safety	1
		Precipitation increase	Fact	Increased precipitation could increase groundwater level and increase pressure on the dam, which could lead to failure of containment structures.	4	Increased precipitation leading to groundwater level increase leading to failure could have major dollar impact (10-20%)	1	There would be no project schedule delay because this is in post-closure.	5	Failure of containment structures for TMF could cause vehement opposition	5	Failure of containment structures for TMF could cause loss of confidence in company	5	Failure of TMF dam could cause detrimental incident.	5	failure of tailings dam could cause multiple deaths.	5
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could lead to liquified tailings, and failure of containment structures.	4	Liquified tailings could cause major dollar impact.	1	There would be no project schedule delay because this is in post-closure.	5	Liquified tailings could cause vehement opposition	5	Liquified tailings could cause loss of confidence in company	5	Liquified tailings could cause loss of confidence in company	5	Liquified tailings could cause multiple deaths	5
		Drought	Medium Confidence	Drought could kill off vegetation on revegetated TMF. This could cause erosion of cover material, and need for further revegetation efforts (erosion is a secondary impact here, and is not considered in scoring).	1	Veg die off could cause need for revegetation, however this would have incidental dollar impact.	1	Veg die off could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off could cause need for revegetation, however this would have no impact to confidence in company.	1	vegetation die off would have incidental impact on environment.	1	vegetation die off would have incidental impact on health and safety	1
		High Winds	Low Confidence	High winds could impact rehabilitation plans for cover during post-closure	1	veg die off and wind erosion could cause need for revegetation however this could have an incidental dollar impact	1	veg die off and wind erosion could cause need for revegetation however this could have an incidental project delay (considering this is in post-closure).	1	veg die off and wind erosion could cause need for revegetation however this could have only potential opposition, as this is not likely to be wide knowledge.	1	veg die off and wind erosion could cause need for revegetation however this could have no real impact to confidence in company.	1	veg die off and wind erosion could cause need for revegetation however this could cause minor environmental incident with no cleanup.	1	veg die off and wind erosion could cause need for revegetation however this could cause no real health and safety impacts.	1
		Wildfires	Medium Confidence	Wildfire could kill off vegetation on TMF leading to increased erosion, and impacting revegetation planning/natural restoration	1	Veg die off could cause need for revegetation, however this would have incidental dollar impact.	1	Veg die off could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off could cause need for revegetation, however this would have no impact to confidence in company.	1	vegetation die off would have incidental impact on environment.	1	vegetation die off would have incidental impact on health and safety	1
	Other Revegetated areas	Evapotranspiration	Medium Confidence	Evapotranspiration could cause dry conditions, which could kill off vegetation on revegetated areas. This could cause erosion of cover material, and need for further revegetation efforts.	1	Veg die off could cause need for revegetation, however this would have incidental dollar impact.	1	Veg die off could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off could cause need for revegetation, however this would have no impact to confidence in company.	1	vegetation die off would have incidental impact on environment.	1	vegetation die off would have incidental impact on health and safety	1
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could cause runoff from revegetated areas, increasing movement of contaminates. Could also cause erosion of cover material.	2	Increased movement of contaminants off site could cause need or clean up or fines, however would likely be minor dollar impact.	1	Increased movement of contaminants off site could cause need or clean up or fines, however would be incidental to project schedule considering in post-closure.	2	Increased movement of contaminants off site could cause need or clean up or fines which could cause some opposition.	2	Increased movement of contaminants off site could cause need or clean up or fines which could cause limited impact on confidence in company.	3	Increased movement of contaminants off site could cause need or clean up or fines which could cause a minor environmental incident with some remediation required.	1	Increased movement of contaminants off site could cause need or clean up or fines which could cause a minor environmental incident with some remediation required.	3
		Flooding	Likely / High Confidence	Flooding could cause increased movement of contaminates from revegetated areas, could also cause erosion of cover material.	2	Increased movement of contaminants off site could cause need or clean up or fines, however would likely be minor dollar impact.	1	Increased movement of contaminants off site could cause need or clean up or fines, however would be incidental to project schedule considering in post-closure.	2	Increased movement of contaminants off site could cause need or clean up or fines which could cause some opposition.	2	Increased movement of contaminants off site could cause need or clean up or fines which could cause limited impact on confidence in company.	3	Increased movement of contaminants off site could cause need or clean up or fines which could cause a minor environmental incident with some remediation required.	1	Increased movement of contaminants off site could cause need or clean up or fines which could cause a minor environmental incident with some remediation required.	3
		Drought	Medium Confidence	Drought could kill off vegetation on revegetated areas. This could cause erosion of cover material, and need for further revegetation efforts (erosion is a secondary impact here, and is not considered in scoring).	1	Veg die off could cause need for revegetation, however this would have incidental dollar impact.	1	Veg die off could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off could cause need for revegetation, however this would have no impact to confidence in company.	1	vegetation die off would have incidental impact on environment.	1	vegetation die off would have incidental impact on health and safety	1
		High Winds	Low Confidence	High winds could impact rehabilitation plans for cover during post-closure	1	Veg die off could cause need for revegetation, however this would have incidental dollar impact.	1	Veg die off could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off could cause need for revegetation, however this would have no impact to confidence in company.	1	vegetation die off would have incidental impact on environment.	1	vegetation die off would have incidental impact on health and safety	1
		Wildfires	Medium Confidence	Wildfire could kill off vegetation on revegetated areas causing need for further revegetation efforts, and increasing erosion of cover material	1	Veg die off could cause need for revegetation, however this would have incidental dollar impact.	1	Veg die off could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off could cause need for revegetation, however this would have no impact to confidence in company.	1	vegetation die off would have incidental impact on environment.	1	vegetation die off would have incidental impact on health and safety	1
	Dixie Creek Protection Berm	Extreme heat	Fact	Extreme heat could cause die off of vegetation on the berm, which could lead to erosion of berm and potential need for additional erosion protection.	1	Veg die off on berm could cause need for revegetation, but would have incidental dollar impact.	1	Veg die off on berm could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off on berm could cause need for revegetation, however this would have no impact to confidence in company.	1	Vegetation die off on berm would have incidental impact on environment.	1	Vegetation die off on berm would have incidental impact on health and safety	1
		Drought	Medium Confidence	Drought could cause die off of vegetation on the berm, which could lead to erosion of berm and potential need for additional erosion protection.	1	Veg die off on berm could cause need for revegetation, but would have incidental dollar impact.	1	Veg die off on berm could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off on berm could cause need for revegetation, however this would have no impact to confidence in company.	1	Vegetation die off on berm would have incidental impact on environment.	1	Vegetation die off on berm would have incidental impact on health and safety	1
		Extreme Precipitation	Likely / High Confidence	Extreme precipitation could lead to erosion on berm banks, with potential flooding.	1	Erosion of berms would have limited impact on dollar revenue.	1	Erosion of berms would not cause project delay.	1	Erosion of berms would have incidental opposition.	1	Erosion of berms would have incidental impact to confidence in company.	1	Erosion on berm would have incidental impact on environment.	1	Erosion on berm would have incidental impact on health and safety	1
		Flooding	Likely / High Confidence	Flooding across berm would cause undesired movement of water, and cause erosion on berms.	1	Erosion of berms would have limited impact on dollar revenue.	1	Erosion of berms would not cause project delay.	1	Erosion of berms would have incidental opposition.	1	Erosion of berms would have incidental impact to confidence in company.	1	Erosion on berm would have incidental impact on environment.	1	Erosion on berm would have incidental impact on health and safety	1
		High Winds	Low Confidence	High winds could cause wave runup on berm, causing erosion and damaging berm. Could cause need for erosion protection.	1	Erosion of berms would have limited impact on dollar revenue.	1	Erosion of berms would not cause project delay.	1	Erosion of berms would have incidental opposition.	1	Erosion of berms would have incidental impact to confidence in company.	1	Erosion on berm would have incidental impact on environment.	1	Erosion on berm would have incidental impact on health and safety	1
		Wildfires	Medium Confidence	Wildfire could cause die off of vegetation on the berm, which could lead to erosion of berm and potential need for additional erosion protection.	1	Veg die off on berm could cause need for revegetation, but would have incidental dollar impact.	1	Veg die off on berm could cause need for revegetation, however this would have incidental project delay (considering in post-closure)	1	Veg die off could cause need for revegetation, however this would have incidental opposition.	1	Veg die off on berm could cause need for revegetation, however this would have no impact to confidence in company.	1	Vegetation die off on berm would have incidental impact on environment.	1	Vegetation die off on berm would have incidental impact on health and safety	1
	Fish Compensation Areas	Extreme heat	Fact	Extreme heat could cause vegetation in habitat to not be suitable, which could cause die off. Could require revegetation with alternative heat resistant species.	1	Veg die off and reduced habitat quality of fish compensation areas would have incidental dollar impact.	1	Veg die off and reduced habitat quality of fish compensation areas would have incidental project delay (considering in post-closure)	2	Veg die off and reduced habitat quality of fish compensation areas would have some opposition and impact.	2	Veg die off and reduced habitat quality of fish compensation areas would have limited impact on confidence in company.	1	Veg die off and reduced habitat quality of fish compensation areas would have limited impact on environment.	1	Veg die off and reduced habitat quality of fish compensation areas would have limited impact on health and safety	2
		Evapotranspiration	Medium Confidence	Evapotranspiration could cause reduce water quantity, for fish habitat.	1	Reduced habitat quality of fish compensation areas would have incidental dollar impact.	1	Reduced habitat quality of fish compensation areas would have incidental project delay (considering in post-closure).	2	Reduced habitat quality of fish compensation areas would have some impact and opposition.	2	Reduced habitat quality of fish compensation areas would have limited impact on confidence in company.	1	Reduced habitat quality of fish compensation areas would have limited impact on environment.	1	Reduced habitat quality of fish compensation areas would have limited impact on health and safety.	2
		Drought	Medium Confidence	Drought could cause vegetation in habitat to not be suitable and/or water levels to decrease, which could cause die off. Could require revegetation with alternative drought tolerant species.	1	Veg die off and reduced habitat quality of fish compensation areas would have incidental dollar impact.	1	Veg die off and reduced habitat quality of fish compensation areas would have incidental project delay (considering in post-closure)	2	Veg die off and reduced habitat quality of fish compensation areas would have some impact and opposition.	2	Veg die off and reduced habitat quality of fish compensation areas would have limited impact on confidence in company.	1	Veg die off and reduced habitat quality of fish compensation areas would have limited impact on environment.	1	Veg die off and reduced habitat quality of fish compensation areas would have limited impact on health and safety	2
		Extreme precipitation	Likely / High Confidence	Extreme precipitation could cause erosion of edges of unnamed water bodies that are planned for fish habitat. This could reduce quality of habitat.	1	Reduced habitat quality of fish compensation areas would have incidental dollar impact.	1	Reduced habitat quality of fish compensation areas would have incidental project delay (considering in post-closure).	2	Reduced habitat quality of fish compensation areas would have some impact and opposition.	2	Reduced habitat quality of fish compensation areas would have limited impact on confidence in company.	1	Reduced habitat quality of fish compensation areas would have limited impact on environment.	1	Reduced habitat quality of fish compensation areas would have limited impact on health and safety.	2

Infrastructure Component	Climate Hazard	Current SSP1-2.6 Likelihood Score	Current SSP2-4.5 Likelihood Score	Current SSP5-8.5 Likelihood Score	Max Likelihood Current	2050s SSP1-2.6 Likelihood Score	2050s SSP2-4.5 Likelihood Score	2050s SSP5-8.5 Likelihood Score	Max Likelihood 2050s	2080s SSP1-2.6 Likelihood Score	2080s SSP2-4.5 Likelihood Score	2080s SSP5-8.5 Likelihood Score	Max Likelihood 2080s	Risk Score Current	Risk Score (2050s)	Risk Score (2080s)	Potential Treatment	Expected Treatment Impact	Resilient Statement
Revegetated TMF	Evapotranspiration	–	–	–	–	–	–	–	–	3	4	5	5	–	–	L18	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Precipitation increase	–	–	–	–	–	–	–	–	5	5	5	5	–	–	H1	- Use Great Bear Resources existing monitoring and reporting practices to monitor climate over the operations phase to better understand how observed changes in climate hazards and the mine infrastructure may impacting post-closure - Consider climate change projections in detailed design of post-closure infrastructure and update of interim and final closure plan. - Final Closure plan will be reviewed based on the above data.	- Post closure infrastructure will be designed and maintained to be resilient to future extreme precipitation events, flooding, and dry conditions.	Considered Resilient to Climate Change Post-Treatment.
	Extreme precipitation	–	–	–	–	–	–	–	–	3	3	4	4	–	–	H2	- Use Great Bear Resources existing monitoring and reporting practices to monitor climate over the operations phase to better understand how observed changes in climate hazards and the mine infrastructure may impacting post-closure - Consider climate change projections in detailed design of post-closure infrastructure and update of interim and final closure plan. - Final Closure plan will be reviewed based on the above data.	- Post closure infrastructure will be designed and maintained to be resilient to future extreme precipitation events, flooding, and dry conditions.	Considered Resilient to Climate Change Post-Treatment.
	Drought	–	–	–	–	–	–	–	–	3	3	4	4	–	–	L20	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	High Winds	–	–	–	–	–	–	–	–	4	4	4	4	–	–	L20	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Wildfires	–	–	–	–	–	–	–	–	3	3	3	3	–	–	L22	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
Other Revegetated areas	Evapotranspiration	–	–	–	–	–	–	–	–	3	4	5	5	–	–	L18	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Extreme precipitation	–	–	–	–	–	–	–	–	3	3	4	4	–	–	M10	- Continually update to best management and maintenance programs for water management and other infrastructure during post-closure design and into post-closure.	- Implementation of best practice measures for post-closure activities will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Flooding	–	–	–	–	–	–	–	–	4	5	4	5	–	–	H6	- Use Great Bear Resources existing monitoring and reporting practices to monitor climate over the operations phase to better understand how observed changes in climate hazards and the mine infrastructure may impacting post-closure - Consider climate change projections in detailed design of post-closure infrastructure and update of interim and final closure plan. - Final Closure plan will be reviewed based on the above data.	- Post closure infrastructure will be designed and maintained to be resilient to future extreme precipitation events, flooding, and dry conditions.	Considered Resilient to Climate Change Post-Treatment.
	Drought	–	–	–	–	–	–	–	–	3	3	4	4	–	–	L20	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	High Winds	–	–	–	–	–	–	–	–	4	4	4	4	–	–	L20	- Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Wildfires	–	–	–	–	–	–	–	–	3	3	3	3	–	–	L22	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
Dixie Creek Protection Berm	Extreme heat	–	–	–	–	–	–	–	–	4	5	5	5	–	–	L18	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Drought	–	–	–	–	–	–	–	–	4	5	5	5	–	–	L18	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Extreme Precipitation	–	–	–	–	–	–	–	–	3	3	4	4	–	–	L22	- Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Flooding	–	–	–	–	–	–	–	–	4	5	4	5	–	–	L18	- Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	High Winds	–	–	–	–	–	–	–	–	4	4	4	4	–	–	L20	- Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
	Wildfires	–	–	–	–	–	–	–	–	3	3	3	3	–	–	L22	- Adapt vegetation selected for post-closure to based on future climate conditions. - Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
Fish Compensation Areas	Extreme heat	–	–	–	–	–	–	–	–	4	5	5	5	–	–	M11	- Continually update to best management and maintenance programs for water management and other infrastructure during post-closure design and into post-closure.	- Implementation of best practice measures for post-closure activities will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Evapotranspiration	–	–	–	–	–	–	–	–	3	4	5	5	–	–	M11	- Continually update to best management and maintenance programs for water management and other infrastructure during post-closure design and into post-closure.	- Implementation of best practice measures for post-closure activities will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Drought	–	–	–	–	–	–	–	–	4	5	5	5	–	–	M11	- Continually update to best management and maintenance programs for water management and other infrastructure during post-closure design and into post-closure.	- Implementation of best practice measures for post-closure activities will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.
	Extreme precipitation	–	–	–	–	–	–	–	–	3	3	4	4	–	–	M14	- Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.

Infrastructure Category	Infrastructure Component	Climate Hazard	Confidence Level	Interaction Description	Consequence Ratings – Dollar Impact – Dollar Impact (revenue, cost, project budget, value)	Justification	Project Schedule Delay	Justification	Licence to Operate – Indigenous Peoples and Stakeholder Relations & Reputation (Operations)	Justification	Indigenous Peoples and Stakeholder Relations & Reputation (Corporate)	Justification	Environment	Justification	Safety – Health and Safety	Justification	Max. Consequence Score	Current – SSP1-2.6 Likelihood Score	Current – SSP2-4.5 Likelihood Score	Current – SSP5-8.5 Likelihood Score	Max Likelihood Current	2050s – SSP1-2.6 Likelihood Score	2050s – SSP2-4.5 Likelihood Score	2050s – SSP5-8.5 Likelihood Score	Max Likelihood 2050s	2080s – SSP1-2.6 Likelihood Score	2080s – SSP2-4.5 Likelihood Score	2080s – SSP5-8.5 Likelihood Score	Max Likelihood 2080s	Risk Score Current	Risk Score (2050s)	Risk Score (2080s)	Potential Treatment	Expected Treatment Impact	Resilient Statement
		Flooding	Likely / High Confidence	Flooding out of water could have potential detrimental impacts to the health of fish.	1	Reduced habitat quality of fish compensation areas would have incidental dollar impact.	1	Reduced habitat quality of fish compensation areas would have incidental project delay (considering in post-closure).	2	Reduced habitat quality of fish compensation areas would have some impact and opposition.	2	Reduced habitat quality of fish compensation areas would have would have limited impact on confidence in company.	1	Reduced habitat quality of fish compensation areas would have limited impact on environment.	1	Low impact on health and safety.	2	–	–	–	–	–	–	–	–	4	5	4	5	–	–	M11	- Include as part of post-closure Operating Maintenance and Surveillance Plans.	- Implementing existing procedures will manage low risks for post-closure infrastructure.	Considered Resilient to Climate Change Post-Treatment.
		Wildfires	Medium Confidence	Wildfire could cause vegetation in habitat to die off, which. Could require revegetation. Debris from the wildfire could also impact the quality of habitat.	1	Veg die off and reduced habitat quality of fish compensation areas would have incidental dollar impact.	1	Veg die off and reduced habitat quality of fish compensation areas would have incidental project delay (considering in post-closure)	2	Veg die off and reduced habitat quality of fish compensation areas would have some impact and opposition	2	Veg die off and reduced habitat quality of fish compensation areas would have limited impact on confidence in company.	1	Veg die off and reduced habitat quality of fish compensation areas would have limited impact on environment.	1	Veg die off and reduced habitat quality of fish compensation areas would have limited impact on health and safety	2	–	–	–	–	–	–	–	–	4	5	5	5	–	–	M11	- Continually update to best management and maintenance programs for water management and other infrastructure during post-closure design and into post-closure.	- Implementation of best practice measures for post-closure activities will adapt to future climate risks.	Considered Resilient to Climate Change Post-Treatment.