



## **KUDZ ZE KAYAH PROJECT**

### **WATER MANAGEMENT PLAN**

**REV 05**

June 2026

**BMC MINERALS LTD.**

This Management Plan has been developed to meet the appropriate subject objectives based on existing regulatory requirements, current or planned site activities, existing and expected site conditions, and designed outcomes at the time of writing. Operational processes/practices for achievement of licence terms and conditions may be updated from time to time as appropriate due to changes to relevant legislation and regulations, changes to site activities or conditions, differences from expected objective outcomes, or improvement of management practices. All rates, capacities, dimensions, weights, volumes and durations in text or figures are based on current feasibility level designs and are subject to change based on final design, licence conditions or site conditions encountered. Updates will be resubmitted to government authorities and/or stakeholders as required.

## LIST OF REVISIONS

| Issue Date        | Revision Number | Description of Revision                                                                                                                                                          |
|-------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| November 20, 2020 | Rev 00          | Issue to Water Board                                                                                                                                                             |
| February 4, 2021  | Rev01           | Updated with commitments and Decision Document concordances                                                                                                                      |
| July 18, 2022     | Rev 02          | Updated with responses to Yukon Water Board Secretariate Information Requests; and edits from final BMC review                                                                   |
| June 18, 2024     | Rev 03          | Updated in response to Phase 5a IR from EMR dated July 19, 2023 and interventions on BMC's Type A Water Licence Application                                                      |
| July 5, 2024      | Rev 04          | Appended Conceptual Groundwater Model, for issuance only to Yukon Water Board.                                                                                                   |
| June 1, 2026      | Rev 05          | Administrative updates in response to EMR Completeness check, and minor updates to reflect the 2026 Decision Document. Removed Conceptual Groundwater Model for issuance to EMR. |



## SUMMARY OF REVISIONS

| Information Request/Intervention                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Document              | Exhibit | Section      | Revision                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Rev 03</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                       |         |              |                                                                                                                                                                                                                                                                                                        |
| YG Intervention (Exhibit 5.2) Recommendation 37:<br>The water treatment facilities should not be dismantled until stability in the pit lake chemistry is established and alternative treatment processes are demonstrated to be effective.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Water Management Plan | 1.16    | 6.3.10       | Added details of required conditions for the WTP to be dismantled.                                                                                                                                                                                                                                     |
| YG Intervention (Exhibit 5.2) Recommendation 39:<br>A range of sensitive scenarios should be completed using an upper-case source term to evaluate the range of possible concentrations to determine if sufficient mitigation is in place.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Water Management Plan | 1.16    | 5.2          | Developed sensitivity scenarios including an upper-case source term and wet and dry years.                                                                                                                                                                                                             |
| Liard First Nation Intervention (Exhibit 5.6.1) Page 9:<br>The proposed active water treatment plant includes Feed 1 and Feed 2, which have maximum treatment capacities of 140 and 390 m <sup>3</sup> /hr, respectively. However, as shown in Figure 6-25 and 6-26 of Appendix C-5 Water Management Plan, the 90 <sup>th</sup> percentile feed flowrates exceed the maximum treatment rate for both Feed 1 and 2 in some of years during the Operations phase. It is not clear if this issue could be mitigated through water storage as the water balance modeling is not adequate. Further, the Application describes treatment of Class B water as a contingency. As per the previous paragraph, the capacity for treatment appears inadequate even before Class B water is considered. | Water Management Plan | 1.16    | 6.3.10       | WTP Feed 1 capacity has been increased to 200 m <sup>3</sup> /hr, corresponding with an approximately 2% probability of annual exceedance, based on the updated Water Balance Model, and assuming that the adaptive management approaches defined in the Adaptive Management Plan are not implemented. |
| EMR Phase 5a IR 21:<br>The dam classification summary provided in Table 4-1 needs to be reviewed and updated in accordance with the 2023 Guidelines for Mine Waste Management Facilities. Classification of the facilities, as defined in the 2023 Guide must be added to Table 4-1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Water Management Plan | 1.16    | 4.1          | Updated to provide classifications developed in accordance with the <i>Yukon Guidelines for Mine Waster Management Facilities</i> .                                                                                                                                                                    |
| EMR Phase 5a IR 24:<br>Collection ponds are used for sediment removal in run off from the overburden and Class C facilities prior to water discharge to the environment. Provide clarification that the design of these collection ponds considers the accumulation of sediment without adversely impacting storage capacities.                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Water Management Plan | 1.16    | 6.3.5, 6.3.6 | Added details of pond design in relation to accumulation of sediment.                                                                                                                                                                                                                                  |
| EMR Phase 5a IR 28:<br>Information requests with respect to the management of frozen materials were included in MRBs Phase 4 information request. Update Section 6.7 of the Water Management Plan with information on frozen materials management information to ensure consistency across management plans.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Water Management Plan | 1.16    | 6.7          | Reference added to the detailed discussion of frozen material management provided in the Open Pit Mine Development and Operations Plan.                                                                                                                                                                |

## LIST OF ACRONYMS AND ABBREVIATIONS

|                 |                                                                      |
|-----------------|----------------------------------------------------------------------|
| AMP             | Adaptive Management Plan                                             |
| AEG             | Alexco Environmental Group Inc.                                      |
| BC MOE          | British Columbia Ministry of Environment                             |
| BMC             | BMC Minerals Ltd.                                                    |
| Bq/L            | Becquerel per litre                                                  |
| CCME            | Canadian Council of Ministers of the Environment                     |
| CDA             | Canadian Dam Association                                             |
| COPI            | Constituents of Potential Interest                                   |
| DOC             | Dissolved Organic Carbon                                             |
| EMAC            | Environmental Management Advisory Committee                          |
| EMR             | Yukon Department of Energy, Mines and Resources                      |
| EQS             | Effluent Quality Standard                                            |
| ENV             | British Columbia Ministry of Environment and Climate Change Strategy |
| FWQG            | Federal Water Quality Guideline                                      |
| HDPE            | High-density polyethylene                                            |
| Kaska           | Kaska First Nation                                                   |
| KP              | Knight Piésold Ltd.                                                  |
| KZK             | Kudz Ze Kayah                                                        |
| km              | Kilometres                                                           |
| km <sup>2</sup> | Square kilometres                                                    |
| L               | Litre                                                                |
| LGO             | Low Grade Ore                                                        |
| LOM             | Life of Mine                                                         |
| LWMP            | Lower Water Management Pond                                          |
| m               | Metres                                                               |
| masl            | metres above sea level                                               |
| mg/L            | Milligram per litre                                                  |
| mm              | Millimetres                                                          |
| m <sup>3</sup>  | Cubic metres                                                         |
| OMS             | Operation, Monitoring and Surveillance                               |
| PAG             | Potentially Acid Generating                                          |
| RRDC            | Ross River Dena Council                                              |
| ROM             | Run of Mine                                                          |
| SEPA            | Socio-Economic Participation Agreement                               |
| SSWQO           | Site Specific Water Quality Objectives                               |
| SCS             | Soil Conservation Service                                            |
| USDA            | United States Department of Agriculture                              |
| UWMP            | Upper Water Management Pond                                          |
| VCC             | Variable Climate Case                                                |
| WBM             | Water Balance Model                                                  |
| WMP             | Water Management Plan                                                |
| WQM             | Water Quality Model                                                  |

|     |                          |
|-----|--------------------------|
| WQO | Water Quality Objectives |
| WTP | Water Treatment Plant    |

## GLOSSARY

**Active Closure:** Post mining removal of Water Management Ponds, Overburden Stockpile, collection ponds, removal of all pipe works and structures, and the removal and re-grading of all access roads, ditches and borrow areas not required during closure phases.

**Baseline:** The existing condition of the biophysical system prior to commencement of the Construction and/or Operations.

**Closure Phase:** the phases following Operations which encompass Active Closure, Transition Closure and Post-closure.

**Construction Phase:** Project phase that will last approximately 2 years and includes Project site preparation and clearing and establishment of Project infrastructure.

**Contact Water:** Surface water or other water that comes into contact with disturbed surfaces in the Project footprint.

**Discharge:** The volume of water flowing in a channel or pipe defined at a given location or cross-section of the channel.

**Ecoregion:** Ecoregions represent smaller areas of ecozones characterized by distinctive physiography and ecological responses to climate as expressed by the development of vegetation, soil, water, and fauna.

**Ecozone:** Ecozones are large and generalized ecological units characterized by interactive abiotic factors. Five ecozones are recognized in Yukon: Southern Arctic, Pacific Maritime, Taiga Plain, Boreal, and Taiga Cordillera.

**Effluent:** Liquid waste discharge.

**Erosion:** The mobilization of land surfaces by water, wind or other natural agents.

**Evapotranspiration:** The process by which water is transferred from the land to the atmosphere by evaporation from land and water surfaces and by transpiration from plants.

**Existing Conditions:** Existing conditions include considerations of “historic” environmental conditions (through previous studies conducted in the area), Traditional Knowledge, available regional or case studies, and information gathered as part of the Project baseline field programs.

**Freshet:** An increase in stream flow resulting from snow and ice melt due to spring thaw.

**Geochemical:** The related chemical and geological properties of a substance.

**Glacial Till:** Unsorted glacial sediment which is derived from the erosion and entrainment of material by the moving ice of a glacier.

**Hardness:** The amount of dissolved calcium and magnesium in water (i.e., hard water has high dissolved calcium and magnesium).

**Haul Road:** A road designed for haul truck traffic that connects the ABM open pit to the Process Plant and Waste Storage Facilities.

**Hydrometeorology/Hydrometeorological:** Pertaining to the transfer of water and energy from the atmosphere to the land surface, encompassing meteorology and hydrology.

**Influent:** Water, wastewater, or other liquid flowing into a reservoir, basin, pond, or treatment plant.

**Initial Environmental Evaluation:** A previous body of work completed at Kudz Ze Kayah in the 1990's by Cominco, which included wildlife baseline surveys.

**Kaska (i.e., Kaska First Nations):** A transboundary Nation involving Kaska people from the Ross River Dena Council and Liard First Nation in southeastern Yukon, and Daylu Dena Council, Dease River First Nation and Kwadacha Nation in northern British Columbia.

**Mean Annual Precipitation:** The average amount of precipitation, expressed in mm, which will fall on a specified area in a single year.

**Mean Annual Runoff:** The average value of total annual runoff amounts usually estimated from the period of record or during a specified base period from a specified area.

**Mean Annual Temperature:** The average temperature in a single year, expressed in °C, at a given location.

**Operations Phase:** Project phase that will last approximately 10 years and includes open pit and underground mining, and ore processing.

**Overburden:** Rock or soil overlying bedrock or other underground feature.

**Permafrost:** Soil, rock or sediment that is frozen for more than two consecutive years. In areas not overlain by ice, it exists beneath a layer of soil, rock or sediment, which freezes and thaws annually and is called the "active layer".

**Permeability:** The measure of the ability of a material to transmit water and air.

**Post-closure:** Project phase that is assumed to begin once all physical activities have finished onsite and will continue until active monitoring is no longer required.

**Potentially Acid Generating:** Acid rock drainage occurs naturally in some environments as part of the rock weathering process but may be accelerated by large-scale earth disturbances in rocks containing an abundance of sulphide minerals. Rocks are assessed as to whether they may be potentially acid generating, if disturbed.

**Project (the Project):** Refers to the Kudz Ze Kayah Mine Project.

**Project Area:** Refers to the general Project location and surrounding area.

**Project Footprint:** Refers to the area in which the Project Infrastructure will be located and is the area of direct disturbance from the Project activities.

**Runoff and Surface Runoff:** The amount of water flowing in a channel or past a specific point.

**Solifluction:** The gradual movement of wet soil or other material down a slope, especially where frozen subsoil acts as a barrier to the percolation of water.

**Tailings:** The material remaining after processing of ore to remove the valuable minerals in the ore.

**Transition Closure:** The period when the ABM open pit is filling with water, and reclamation activities have been completed for the Class A, B and C Storage Facilities. A Constructed Wetland Treatment System will be constructed in Geona Creek and collection ponds will be removed.

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Appendix A: Table of Concordance

## 1. INTRODUCTION

BMC Minerals Ltd. (BMC) is the owner of the Kudz Ze Kayah Project (the Project). Since acquiring the Project in 2015, BMC has actively engaged in assessing historical work, optimizing design, resource drilling, economic assessment, baseline environmental studies, and First Nations and community engagement as well as the successful completion of the Executive Committee Screening by the Yukon Environmental and Social-Economic Assessment Board.

The following key waste and water management facilities are planned be developed during the life of the Project:

- Collection ditches and diversion channels;
- Upper Water Management Pond (UWMP);
- Lower Water Management Pond (LWMP);
- Pit Rim Pond;
- Class A Storage Facility, and associated Class A Storage Facility Collection Pond;
- Class B Storage Facility, and associated Class B Storage Facility Collection Pond;
- Class C Storage Facility, and associated Class C Storage Facility Collection Pond;
- Overburden Stockpile, and associated Overburden Stockpile Collection Pond; and
- Water Treatment Plant.

A key design feature of the Project layout includes separation and storage of clean inert material on the east slope of the Geona Creek Valley and all processing activities and storage of potentially acid generating and metal leaching material on the west slope of the Geona Creek Valley.

This Water Management Plan (WMP) presents the water management objectives, strategies and design methodology for Project water management. The WMP was developed from site-specific design basis and criteria, supported by the integration of baseline studies and various water-related modelling studies.

The WMP focuses on the management of water in Geona Creek, Finlayson Creek, and South Creek drainage areas from Construction through to end of Operations. The water management strategies specific to Closure are described in the Reclamation and Closure Plan (BMC, 2026a).

Details of the construction of water management structures associated with the site service and haul roads including diversion ditch design are presented in the Road Construction Plan (BMC, 2026b). Specific design details of the water management structures associated with the Class A Storage Facility are presented in the Tailings Management Plan (BMC, 2026c), and the Class B Storage Facility, Class C Storage Facility and Overburden Stockpile are presented in the Waste Rock and Overburden Management Plan (BMC, 2026d).

## **1.1 PLAN REVIEW AND EXECUTION**

BMC has had extensive engagement with Ross River Dena Council (RRDC) including community meetings in Ross River, Elders Oversight Committee Meetings, meetings with Chief and Council and engagement with RRDC's wholly owned environmental consultancy, Dena Cho Environmental and Remediation Inc. (Dena Cho). As part of this ongoing engagement, prior to this Plan being finalized Dean Cho conducted a detailed independent review of the draft plan. Issues raised during the Dena Cho review were addressed collaboratively through a number of workshops and where appropriate this plan was amended and additional commitments added.

BMC and Ross River Dena Council (in its role as lead community for the Kaska Nations, including Liard First Nation) are parties to an existing Socio-Economic Participation Agreement (SEPA) for the KZK Project. In 2019, BMC and RRDC signed a Letter of Intent committing the parties to a modernization process for the existing SEPA. In March 2021, BMC tabled a proposed modernized SEPA with all Kaska leadership. The proposed SEPA includes provision for establishment of a Kaska/BMC Environmental Management Advisory Committee (EMAC). Under the current proposal before Kaska, this committee will be tasked with, among other things, reviewing and providing input into environmental management plans, reporting on implementation of those plans, reviewing monitoring plans/results, and reviewing incident reports and reporting back to Kaska members.

## **2. WATER MANAGEMENT PLANNING**

### **2.1 OBJECTIVES**

The objectives of the WMP are as follows:

- Protect and conserve water resources (including surface water and groundwater quantity and quality, and the aquatic ecosystem) from adverse effects caused by the Project;
- Minimize the impact on the receiving environment by effectively managing runoff and providing safe conveyance or containment of water during extreme peak runoff events;
- Minimize release of impacted water (including sediment laden water) to the environment;
- Reduce the volume of contact water requiring management and treatment, while reducing the effects to streamflows in the receiving environment, by diverting clean surface water around the Project area where practicable;
- Reuse water in the Project area to the maximum practicable extent including maximizing the recycle of process water;
- Protect infrastructure from damage to maintain safety and minimize financial costs for repair or replacement; and
- Promote stabilization and re-growth of vegetation in the Project area.

### **2.2 STRATEGY**

The water management strategies that will aim to achieve the objectives listed above are summarized as follows:

- Surface water runoff generated upstream of Project areas will be diverted around the Project area with diversion channels established during the Construction phase that will be expanded and maintained through the Operations phase;
- Two water management ponds will be constructed in the Geona Creek Valley to manage site surplus water: the UWMP will collect sediment-laden runoff from within the Project area, and the LWMP will be used as the final holding pond for all site contact water prior to release to the receiving environment;
- Runoff and seepage from tailings, waste rock and overburden management facilities will be collected in collection ditches and routed to lined ponds located downgradient of each facility (the Class A Storage Facility Collection Pond, the Class B Storage Facility Collection Pond, the Class C Storage Facility Collection Pond and the Overburden Stockpile Collection Pond);
- Groundwater and surface water intercepted during dewatering of the ABM open pit and underground workings will be collected and pumped to the Pit Rim Pond; and
- Site affected water will eventually be discharged from the LWMP to both Geona Creek and Finlayson Creek at or below established effluent quality standard (EQS) (Ensero, 2024a)

concentrations and discharge volume ratios to ensure that water quality objectives (WQO) in the receiving environment are met (Ensero and Minnow, 2024).

## **2.3 WATER USE REGULATORY AUTHORIZATIONS**

This Water Management Plan details all components of the Project's water management; however, BMC may submit multiple Water Licence Applications to the Yukon Water Board including:

- Type A (Quartz Mining Undertaking) Water Licence;
- Type B (Municipal Undertaking) Water Licence; and
- Amended Type B (Quartz Mining Undertaking) Water Licence (QZ16-085).

### **3. BASELINE CONDITIONS AND SUMMARY OF RELEVANT STUDIES**

Climatic and hydrological characterization of the Project site is presented in the Site Characterization Plan (BMC, 2026e). These characterizations are presented in terms of the expected long-term climatic and hydrological conditions.

The long-term estimates are based on data collected at the Project site, including data collected in 1995 and from 2015 to March 2023, as well as regional datasets. BMC (2026e) integrates and analyzes data collected at the Project site with regional data sourced from Environment and Climate Change Canada, Environment Yukon, and Water Survey of Canada.

The following reports summarize the baseline data utilized in preparing the Project's WMP:

- Initial Environmental Evaluation Kudz Ze Kayah Project, Yukon Territory (Cominco, 1996);
- KZK Hydrogeological Assessment (Tetra Tech EBA, 2016);
- Hydrogeological Model Revision (Tetra Tech EBA, 2019);
- 2022 Hydrometeorology Baseline Report, Kudz Ze Kayah Project (Ensero, 2023a);
- 2022 Surface Water Quality Baseline Report (Ensero, 2023b);
- 2019 Hydrology and Climate Analysis Report (KP, 2019a); and
- 2022 Hydrogeology Baseline Report (Ensero, 2023c).

Additional studies that have been used to develop the Project's WMP include:

- Updated WTP Effluent Predictions (BQE, 2019a);
- Storm Water Model (KP, 2019b);
- Life of Mine Water Balance (KP, 2024a);
- Proposed Effluent Quality Standards (Ensero, 2024a);
- Water Quality Model (Ensero, 2024b);
- Water Quality Objectives (Ensero and Minnow, 2024); and
- Conceptual and numerical groundwater models (KP, 2024b; Tetra Tech EBA, 2019).

#### **3.1 REGIONAL SETTING**

The Project is located in the Boreal Cordillera Ecozone, situated in a transitional climatic zone bordering on three different ecoregions: Yukon Plateau to the north, Liard Basin to the east, and Pelly Mountains ecoregion to the south (Smith et al., 2004). This ecozone is characterized by the presence of several mountain ranges that trend in the northwesterly direction and include numerous high peaks and extensive plateau regions. The plateaus consist of flat or gently rolling upland terrain separated by broad valleys and lowlands.

The climate is characterized by long, cold winters and short, warm summer with conditions varying according to elevation and aspect. Streamflow in the region is typically highest in June due to snowmelt (freshet). Annual peak instantaneous flows typically occur during the freshet period on large rivers, but on smaller streams these peaks may also occur during summer or early fall due to intense rain or rain on snow events. Flows are lower through the winter and minimum flows typically occur in March or April.

The Project site is in an area of discontinuous permafrost. Permafrost has been encountered under the organic layers that cover the Geona and upper Finlayson valleys. Permafrost is typically located under poorly drained areas, cool aspects, and upper elevations. Permafrost related ground movement or solifluction is apparent on upper to middle elevation slopes (Palmer, 2023).

Additional description of the regional setting for the Project can be found in the Site Characterization Plan (BMC, 2026e).

### **3.2 CLIMATE**

The Project area has a typical northern interior climate, with cool and short summers and long and very cold winters. The mean annual temperatures at regional stations over the period of record have ranged from -4.7°C at Ross River to -2.0°C at Faro A Station, with mean January temperatures of -30°C and mean July temperatures of 15 °C. Extreme annual temperatures ranged from -59.4°C at Ross River in December to 35.4°C at Watson Lake in July. Mean annual precipitation at regional stations ranged from 210 mm at Ross River to 710 mm at Ketza River Mine; and the proportion of total annual precipitation falling as rain ranged from 39% at Ketza River Mine up to 70% at Ross River and Faro. The greatest amount of precipitation generally falls between June and September for all regional stations.

The Site Characterization Plan (BMC, 2026e) provides a comprehensive summary of the available regional and site-specific climate data and long-term estimates representative of the Project site, including temperature, precipitation, wind, relative humidity, barometric pressure, solar radiation, evaporation and evapotranspiration.

### **3.3 PHYSIOGRAPHY**

The Project is located in the northern portion of the Pelly Mountain ecoregion. Terrain consists of a rolling plateau topped by numerous mountain peaks dissected in places by small rivers. Elevation in the Project site ranges from 1,000 metres above sea level (masl) at the beginning of the Tote Road (at the Robert Campbell Highway) to 2,000 masl at the southwestern extent of the Project area, with the proposed infrastructure located between 1,300 and 1,600 masl.

The Project is situated in the upper Geona Creek Valley, which is surrounded by larger steeper sided mountain slopes. A series of shallow wetlands occur along Geona Creek due to historical beaver dams in the valley bottom. Side valleys east of the Geona Creek Valley are relatively broad and U-shaped. Tributaries such as Fault Creek, are high velocity streams that have incised the mountain slopes before depositing sediment into Geona Creek.

Additional details of the surficial geology and physiography of the Project are summarized in the Site Characterization Plan (BMC, 2026e).

### **3.4 SURFACE WATER**

The Project is situated in a small, approximately 26 km<sup>2</sup>, watershed that feeds Geona Creek which is a northern tributary to Finlayson Creek. Finlayson Creek meets the outflow of Finlayson Lake near the Robert Campbell Highway and flows east to eventually join the Frances River, then Liard River and ultimately the Mackenzie River, which drains north to the Beaufort Sea.

Annual flow patterns in medium and large river systems in the Yukon Plateau North ecoregion are characterized by very low winter flows that undergo a rapid increase in snowmelt discharge that reaches a peak in June, with secondary rainfall-generated peaks throughout the summer from rainfall events. On smaller streams, flows are very low in the coldest winter months, many of the annual maximum flows are due to intense summer rainstorm events, and monthly flows are often high in late summer due to rainfall.

The mean annual runoff in the region ranges from approximately 200 mm to 400 mm. Minimum streamflow generally occurs during February or March, as groundwater stores deplete over the winter when temperatures are low and very little surface runoff or groundwater recharge occurs (Smith et. al., 2004).

Additional details of the surface water of the Project are summarized in the Site Characterization Plan (BMC, 2026e).

### **3.5 GROUNDWATER**

The principal hydrogeologic units at the Project site are bedrock and overburden. The overburden consists of two sub-units:

- Fine-grained lower permeability sediments composed of silts and fine sands; and
- Coarse-grained higher permeability sands and gravels.

The water levels in bedrock and overburden exhibit the following seasonal trends:

- Rising water levels through the summer months (approximately May to September);
- Peak water levels reached between August to October, depending on the year;
- Falling water levels through the winter months (approximately October to April); and
- Lowest levels reached between April to June, depending on the year.

Groundwater discharges to receiving water bodies along the valley floors, with Geona Creek being the primary discharge feature in the Project area. The amount of baseflow, (i.e., groundwater seepage into the creeks) depends on the hydraulic gradient and hydraulic conductivity of the shallow overburden aquifer in the vicinity of the receiving stream.



In general, the fraction of baseflow in the creeks is larger in the winter when there is little or no surface runoff or shallow subsurface runoff. The (late) winter creek discharge usually provides a good estimate of the baseflow as it amounts to nearly 100% of the total discharge observed during this time of the year.

KP (2024b) presents a conceptual groundwater model of the Project area, and Tetra Tech EBA (2019) presents a numerical groundwater flow model of the Project area, provided as appendices to the Site Characterization Plan (BMC, 2026e). These models together summarize and characterize the factors influencing groundwater flow in the vicinity of the Project. The numerical model (Tetra Tech EBA, 2019) provides a tool to quantitatively predict the impact of hydrological changes caused by the development of the Project, as well as the potentially affected environment in the event of a release from one of the associated facilities.

## 4. DESIGN BASIS AND CRITERIA

The design basis and operating criteria for the water management facilities are based on Project information and studies including the 2019 Definitive Feasibility Study (KP, 2019b) and relevant design guidelines and regulations.

Design guidelines and regulations include federal and provincial/territorial guidance for the construction and operation of mines and tailings facilities in Canada. The following regulations and guidelines were used to develop the design standards for the Project:

- *Federal Metal and Diamond Mining Effluent Regulations* under the *Fisheries Act* (Government of Canada, 2002);
- *Dam Safety Guidelines* (Canadian Dam Association (CDA), 2013);
- *Technical Bulletin – Application of Dam Safety Guidelines to Mining Dams* (CDA, 2014);
- *BC Environmental Management Act – Technical Guidance Document 7 – Assessing the Design, Size, and Operation of Sediment Ponds Used in Mining* (British Columbia Ministry of Environment (BC MOE), 2015);
- *Guidelines for Mine Waste Management Facilities* (Yukon, 2023); and
- *Yukon Guide for Developing Water Quality Objectives and Effluent Quality Standards for Quartz Mining Projects* (Yukon, 2021).

### 4.1 DAM CLASSIFICATION

A dam classification assessment was carried out to establish the consequence classification of the water management and collection ponds planned for the Project, as summarized in Table 4-1. Consequence classifications are used to support the selection of appropriate design earthquake and flood events for water management structures. The assessment used both the classification criteria provided by the CDA Dam Safety Guidelines (CDA, 2013; CDA, 2014), and by Yukon (2023), as detailed in KP (2024c), provided as an appendix to the Tailings Management Plan (BMC, 2026c).

The suggested Annual Exceedance Probabilities for the flood and earthquake design, as per Yukon (2023) and CDA (2014) based on the associated dam classification per facility, are incorporated into Table 4-2, which outlines the flood-related design criteria for the water management structures.

**Table 4-1: Dam Classification Summary**

| Facility                                 | CDA (2014) Consequence Classification <sup>1</sup> | Yukon (2023) Consequence Classification <sup>2</sup>                                |
|------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------|
| UWMP                                     | Significant                                        | N/A                                                                                 |
| LWMP                                     | Significant                                        | N/A                                                                                 |
| Class A Storage Facility Collection Pond | Low                                                | Class III<br>(due to potential for elevated water quality parameters at some times) |
| Class B Storage Facility Collection Pond | Low                                                | Class II                                                                            |
| Class C Storage Facility Collection Pond | Low                                                | Class II                                                                            |
| Overburden Collection Pond               | Low                                                | Class II                                                                            |
| Pit Rim Pond                             | Low                                                | Class II                                                                            |

Source: <sup>1</sup>KP (2019b); <sup>2</sup>KP (2024c)

## 4.2 STORMWATER DESIGN CRITERIA

Water management structures planned for the Project include diversion channels, collection ditches, and water collection and management ponds.

A risk-based approach was used to select appropriate design storm events for the water management facilities. This approach assigns design criteria based on the consequence classification of each facility, with more stringent criteria for facilities with higher consequence classification, as per industry guidelines (Yukon, 2023; CDA, 2014). Design storm events for each facility are developed by assessing the annual recurrence of precipitation events of a given magnitude (KP, 2019a).

The stormwater criteria for the collection ditches and diversion channels are based on peak discharge as the primary function of these facilities is to convey flow. Peak discharge criteria are also applied to the Class C and Overburden stockpile collection ponds as the primary function of these facilities is to manage suspended sediment prior to releasing flows to the downstream environment. These facilities operate as flow-through systems and are designed following the BC MOE Technical Guidance 7 (BC MOE, 2015), with consideration given to the recommendations in Yukon (2023). BC MOE (2015) specifies the peak discharge criteria for the sediment pond design.

The Class A and Class B Storage Facility Collection Ponds, the Pit Rim Pond, and the UWMP and LWMP are not flow-through systems, therefore, they are designed to collect and store the runoff from these facilities without engaging the spillway outlets. The stormwater design criteria for these facilities is separated into storage requirements and spillway design. The storage requirement is to completely store the total volume of runoff generated from the local catchment during a precipitation event, where the design criteria for the spillways is based on the resulting peak discharge from a storm event larger than the storage requirement which would engage the spillway outlet.

Design storm criteria for the water management facilities are summarized in Table 4-2. The probability of the exceedance of the design return period event is presented in Table 4-3. The hydrometeorological parameters used for the design of the water management facilities are summarized in Table 4-4. These design criteria and associated probabilities of exceedance were

evaluated and determined to be appropriate as part of a failure modes and effects analysis (FMEA) (SRK, 2024), as recommended in Yukon (2023).

**Table 4-2: Water Management Facility Design Criteria**

| Water Management Structure                           | Design Event                                                                                                                                                                                                                                 | Additional Design Criteria                                                                                                                              |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Diversion Channels and Conveyance Pipes <sup>1</sup> | Convey the 1 in 50-year, 24-hour peak discharge with minimum freeboard of 0.3 m. Convey the 1 in 200-year, 24-hour peak discharge with no freeboard.                                                                                         | Climate change uplift applied to Upper Access Road Diversion Channel.                                                                                   |
| Collection Ditches and Culverts <sup>2</sup>         | Convey the 1 in 50-year, 24-hour peak discharge with minimum freeboard of 0.3 m. Convey the 1 in 200-year, 24-hour peak discharge with no freeboard.                                                                                         | Minimum base width of 1.0 m.<br>Minimum side slopes of 2:1.<br>Ditches will be protected against erosion up to the 1 in 200-year, 24-hr peak discharge. |
| Class C Storage Facility Collection Pond             | Treat sediment for the 1 in 10-year, 24-hour precipitation event.                                                                                                                                                                            | Pond lined with high-density polyethylene (HDPE) geomembrane.<br>Minimum side slopes of 2.5:1.                                                          |
| Overburden Stockpile Collection Pond                 | Spillway to safely pass the peak discharge resulting from a 1 in 200-year, 24-hour precipitation event with minimum 1 m freeboard.                                                                                                           | No pumps/pipes, pond operates by gravity discharge.<br>Assumes upstream diversions still active during peak design event.                               |
| Class A Storage Facility Collection Pond             | Store the maximum operational pond volume, with allowance for 1 in 200, -year 24-hour precipitation event.                                                                                                                                   | Pond lined with HDPE geomembrane.<br>Minimum side slopes of 2.5:1.                                                                                      |
| Class B Storage Facility Collection Pond             | Spillway to safely pass the peak discharge resulting from a 1 in 1,000 year, 24-hour precipitation with minimum 1 m freeboard.                                                                                                               | Climate change uplift applied because ponds will be operational into the Active and Transition Closure phases.                                          |
| UWMP                                                 | Store the maximum operational volume, with allowance for 1 in 200-year, 24-hour precipitation event.                                                                                                                                         | Pond lined with HDPE geomembrane.                                                                                                                       |
| LWMP                                                 | Spillway to safely pass the peak discharge resulting from a 1 in 1,000 year, 24-hour precipitation event with minimum 1 m freeboard.                                                                                                         | Emergency spillway for the UWMP overflows to the LWMP.<br>Emergency spillway for the LWMP overflows to environment (Geona Creek).                       |
| Pit Rim Pond                                         | Store the maximum operational volume, with allowance for 1 in 200-year, 24-hour precipitation event.<br>Spillway to safely pass the peak discharge resulting from a 1 in 1,000 year, 24-hour precipitation event with minimum 1 m freeboard. | Pond lined with HDPE geomembrane.<br>Pond to have three compartments with gravity overflow between settling compartments.                               |

<sup>1</sup> Flow conveyed through pipes in steep sections of diversion channels.

<sup>2</sup> Culverts used for road crossings and beneath the Low Grade Ore Stockpile and Run of Mine Pad. See details in the Road Construction Plan (BMC, 2026b).

**Table 4-3: Probability of Flood Exceeding Design Criteria**

| Design Return Period | Infrastructure                                                                                                                                                                                                                                                                                                                                  | Probability of Exceedance in 10 Years (Operations) | Probability of Exceedance in 15 Years (Construction, Operations and Active Closure) |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------|
| 1 in 10 year         | <ul style="list-style-type: none"> <li>Class C Storage Facility Collection Pond</li> <li>Overburden Stockpile Collection Pond</li> </ul>                                                                                                                                                                                                        | 65%                                                | 79%                                                                                 |
| 1 in 200 year        | <ul style="list-style-type: none"> <li>Diversion channels, conveyance pipes, collection ditches and culverts</li> <li>Class A and B Storage Facility Collection Ponds</li> <li>UWMP and LWMP</li> <li>Pit Rim Pond</li> <li>Class C Storage Facility Collection Pond spillway</li> <li>Overburden Stockpile Collection Pond spillway</li> </ul> | 5%                                                 | 7%                                                                                  |
| 1 in 1,000 year      | <ul style="list-style-type: none"> <li>Class A, and B Storage Facility Collection Pond spillways</li> <li>UWMP and LWMP spillways</li> <li>Pit Rim Pond spillway</li> </ul>                                                                                                                                                                     | 1%                                                 | 1.5%                                                                                |

**Table 4-4: Estimated 24-Hour Extreme Precipitation for KZK Climate Station**

| Return Period (years)          | 24-Hour Extreme Event (mm) | 24-Hour Extreme Event Adjusted 15% for Climate Change (mm) |
|--------------------------------|----------------------------|------------------------------------------------------------|
| 2                              | 33                         | 38                                                         |
| 5                              | 46                         | 53                                                         |
| 10                             | 54                         | 62                                                         |
| 15                             | 59                         | 67                                                         |
| 20                             | 62                         | 71                                                         |
| 25                             | 64                         | 74                                                         |
| 50                             | 72                         | 82                                                         |
| 100                            | 79                         | 91                                                         |
| 200                            | 84                         | 97                                                         |
| 500                            | 93                         | 107                                                        |
| 1,000                          | 103                        | 119                                                        |
| Probable Maximum Precipitation | 242                        | 278                                                        |

Source: KP (2019a).

Table 4-4 reports two values for each storm event, the higher of which represents an allowance for climate change (an increase of 15%). It is generally expected that climate change is accounted for in peak precipitation and flow analyses, and a 10% to 20% climate change factor has evolved in engineering practice as a somewhat “de facto” standard to address this concern (EGBC, 2018). Therefore, a 15% uplift was applied to the return period precipitation values.

The spillways of the Class A and Class B Storage Facility Collection Ponds as well as the Upper Access Road diversion channel were designed using the hydrometeorological parameters with an allowance (uplift) for climate change, as these structures will be operational throughout Operations and into the Closure phases of the Project.

### 4.3 EFFLUENT QUALITY STANDARDS AND WATER QUALITY OBJECTIVES

#### 4.3.1 Effluent Quality Standard

Effluent quality standards (EQS) have been developed for the Project for the LWMP discharge at station KZ-8 and presented in Table 4-5 (Ensero, 2024a). EQS are the maximum concentrations of constituents of potential interest (COPI) that can occur in the site effluent discharge that would result in no exceedances of water quality objectives (WQOs) in the receiving environment at Geona Creek (station KZ-37) and Finlayson Creek (station KZ-15). Details on the methods used to develop and select the EQS are discussed in Ensero (2024a).

**Table 4-5: Proposed EQS for LWMP Discharge**

| COPI                           | Units | EQS (mg/L) | COPI                                   | Units | EQS (mg/L)                                                                        |
|--------------------------------|-------|------------|----------------------------------------|-------|-----------------------------------------------------------------------------------|
| Sulphate                       | mg/L  | 1032       | Nickel, Total                          | mg/L  | 0.3                                                                               |
| Nitrate-N                      | mg/L  | 5.0        | Selenium, Total                        | mg/L  | 0.003                                                                             |
| Nitrite-N                      | mg/L  | 0.082      | Thallium, Total                        | mg/L  | 0.0027                                                                            |
| Ammonia-N, total               | mg/L  | 2.6        | Uranium, Total                         | mg/L  | 0.036                                                                             |
| Ammonia-N (unionized)          | mg/L  | 1.0        | Cadmium, dissolved                     | mg/L  | 0.0006                                                                            |
| Fluoride                       | mg/L  | 3.5        | Copper, dissolved                      | mg/L  | 0.0033                                                                            |
| Aluminum, total                | mg/L  | 0.28       | Lead, dissolved                        | mg/L  | 0.0028                                                                            |
| Antimony, Total                | mg/L  | 0.26       | Manganese, dissolved                   | mg/L  | 1.4                                                                               |
| Arsenic, Total                 | mg/L  | 0.13       | Zinc, dissolved                        | mg/L  | 0.037                                                                             |
| Cobalt, Total                  | mg/L  | 0.0033     | Total Suspended Solids                 | mg/L  | 30                                                                                |
| Iron, Total                    | mg/L  | 0.86       | Radium-226                             | Bq/L  | 1.11                                                                              |
| Cyanide, Weak Acid Dissociable | mg/L  | 0.016      | 96-hour Rainbow Trout LC <sub>50</sub> | -     | Direct exposure of rainbow trout to effluent will not cause 50% mortality of fish |
| pH                             | -     | 6.0-9.5    |                                        |       |                                                                                   |

#### 4.3.2 Water Quality Objectives

WQOs have been developed for the COPIs associated with the Project, listed in Table 4-6 and Table 4-7. Details of the methodology used to derive the WQOs are provided in Ensero and Minnow (2024). The development of the WQOs used a consistent framework that included the adoption of generic guidelines for the Project, the identification of COPIs, the evaluation of potential approaches to developing WQOs and Site Specific Water Quality Objectives (SSWQOs), and the derivation of WQOs

and SSWQOs. COPIs were identified as constituents with concentrations that naturally exceed generic guidelines and those predicted to occur at concentrations greater than generic guidelines during the Project phases (without appropriate mitigation measures). For most water quality constituents, generic water quality guidelines were adopted to evaluate water quality. However, when justified, derivation of WQOs or SSWQOs for a subset of the COPIs was completed to provide technically defensible tools to evaluate potential future departures from baseline concentrations and/or to evaluate the potential for concentrations to affect aquatic life. Derivation of SSWQOs was undertaken following methods outlined by the Canadian Council of Ministers of the Environment (CCME) and derivation of WQOs was undertaken based on updated methodologies and toxicological data. The methods applied are generally consistent with those applied at other permitted mine projects in the Yukon and included the Background Concentration Procedure and the Water Effect Ratio Procedure (CCME, 2003). Potential application of the Recalculation Procedure (CCME, 2003) was also evaluated but was not applied due to the aquatic species present at the Project site.

Derivation of WQOs for two of the COPIs identified for the Project (arsenic and fluoride) was undertaken using an alternative approach. For these COPIs, it was recognized that the existing CCME guidelines were published almost twenty years ago using a development methodology that has since been replaced by the CCME. In addition, the arsenic and fluoride toxicity literature base has expanded substantially since the original promulgation of the arsenic and fluoride CCME guidelines. Therefore, published toxicity data were critically reviewed and studies that met CCME's data quality criteria were used to develop WQOs based on the species sensitivity distribution approach now recommended by CCME. This resulted in a SSWQO for arsenic of 0.037 mg/L and a SSWQO for fluoride of 1.1 mg/L.

Derivation of a SSWQO for selenium also required an alternate approach because the mechanism of potential selenium effects in aquatic environments is dependent upon incorporation into the food chain, movement through the food chain, and dietary exposure to sensitive egg-laying vertebrates (e.g., fish). Standard toxicity test data do not capture this complexity. Because selenium uptake by primary producers accounts for most of the increase in concentration through the trophic levels, and because sulphate is documented to compete with selenium for uptake by primary producers and to thereby reduce selenium uptake into the food chain, selenium uptake studies were completed to support SSWQO derivation. Laboratory testing using Finlayson Creek water demonstrated that selenium uptake by two primary producers was diminished in the presence of increasing sulphate concentrations. A sulphate-dependent selenium SSWQO was developed based on the quantitative modifying relationships. At baseline sulphate concentrations of 60 mg/L or less, the SSWQO was set equivalent to the BC Ministry of Environment and Climate Change Strategy (ENV) guideline (0.002 mg/L), but at higher sulphate concentrations, the selenium SSWQO (in mg/L) is calculated using an equation based on the sulphate concentration ( $0.1736 \times [\text{sulphate in mg/L}]^{0.597} / 1,000$ ).

Derivation of WQOs for total iron was based on the Background Concentration Procedure, given the elevated baseline iron concentrations. Elevated baseline dissolved copper concentrations at stations KZ-37 and KZ-15 during winter resulted in a hybrid WQO approach in which the Background Concentration Procedure was used to develop the WQO during winter months while the generic Federal Water Quality Guideline (FWQG) will be used as the WQO for the other months. The generic

FWQG was used as the WQO for dissolved copper for the other monitoring stations (KZ-13 and KZ-26).

**Table 4-6: Water Quality Objectives Based on CCME, BC ENV and FWQG Guidelines**

| Constituent                    | CCME Guideline Date | BC ENV Guideline Date | FWQG Guideline Date | Generic Guideline used for WQOs                                                                                                                                                                                                      |
|--------------------------------|---------------------|-----------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ammonia-N, unionized           | 2010                | Not available         | Not available       | 0.016 mg/L                                                                                                                                                                                                                           |
| Aluminum, total                | 1987                | 2023                  | 2022                | $(e^{\{[0.645 \cdot \ln(DOC)] + [2.255 \cdot \ln(hardness)] + [1.995 \cdot pH] + [-0.284 \cdot (\ln(hardness) \cdot pH)] - 9.898\}})/1000$ (mg/L) for hardness from 10 to 430 mg/L, pH from 6 to 8.7, and DOC from 0.08 to 12.3 mg/L |
| Antimony, Total                | Not available       | 2023                  | Not available       | 0.074 mg/L                                                                                                                                                                                                                           |
| Cobalt, Total                  | Not available       | 2004                  | 2017                | $e^{\{(0.414 \ln(hardness)) - 1.887\}}/1000$ mg/L for hardness between 52 and 396 mg/L.                                                                                                                                              |
| Cyanide, Weak Acid Dissociable | Not available       | 1986                  | Not available       | 0.005 mg/L                                                                                                                                                                                                                           |
| Nickel, Total                  | 1987                | 1987                  | Not available       | 0.025 mg/L if hardness (as CaCO <sub>3</sub> ) ≤ 60 mg/L or unknown,<br>$(e^{\{0.76[\ln(hardness)] + 1.06\}})/1000$ mg/L if hardness > 60 mg/L and ≤ 180 mg/L,<br>0.15 mg/L if hardness > 180 mg/L                                   |
| Nitrate-N                      | 2012                | 2009                  | Not available       | 3 mg/L                                                                                                                                                                                                                               |
| Nitrite-N                      | 1987                | 1988                  | Not available       | 0.06 mg/L                                                                                                                                                                                                                            |
| Selenium, Total                | 1987                | 2014                  | Not available       | 0.002 mg/L                                                                                                                                                                                                                           |
| Sulphate                       | Not available       | 2013                  | Not available       | 128 mg/L if hardness ≤ 30 mg/L; 218 mg/L if hardness > 30 mg/L and ≤ 75 mg/L;<br>309 mg/L if hardness > 75 mg/L and ≤ 180 mg/L; 429 mg/L if hardness > 180 mg/L and ≤ 250 mg/L                                                       |
| Thallium, total                | 1999                | No final guideline    | Not available       | 0.0008 mg/L                                                                                                                                                                                                                          |
| Uranium, Total                 | 2011                | No final guideline    | Not available       | 0.015 mg/L                                                                                                                                                                                                                           |
| Cadmium, Dissolved             | Not available       | 2015                  | Not available       | $(e^{\{0.736 \cdot \ln(hardness) - 4.943\}})/1000$ mg/L for hardness between 3.4 and 285 mg/L;<br>WER multiplier of 2.9 applied to guideline in May                                                                                  |
| Copper, Dissolved              | Not available       | 2019                  | 2021                | Biotic Ligand Model derived guideline based on temperature, pH, hardness, and DOC inputs;<br>SSWQO applies in selected winter months for KZ-15 (0.00117 mg/L; Jan to Mar) and KZ-15 (0.00134 mg/L; Nov to Apr)                       |
| Lead, dissolved                | Not available       | Not available         | 2020                | $(e^{\{0.514[\ln(DOC)] + 0.214[\ln(Hardness)] + 0.4152\}})/1000$ mg/L for DOC between 0.5 and 31.5 mg/L and hardness between 5 and 511 mg/L                                                                                          |
| Manganese, Dissolved           | 2019                | Not available         | Not available       | Online CCME calculator that is hardness and pH dependent for hardness ≥ 10 mg/L and ≤ 670 mg/L, and pH 5.4-9.0                                                                                                                       |
| Zinc, Dissolved                | 2018                | 2023                  | Not available       | $(e^{\{0.947[\ln(hardness \text{ mg/L})] - 0.815[pH] + 0.398[\ln(DOC \text{ mg/L})] + 4.625\}})/1000$ mg/L. The equation is valid between hardness 23.4 and 399 mg CaCO <sub>3</sub> /L, pH 6.5 and 8.13 and DOC 0.3 to 22.9 mg/L    |

Green shading indicates guideline selected for water quality objective



**Table 4-7: Site Specific Water Quality Objectives**

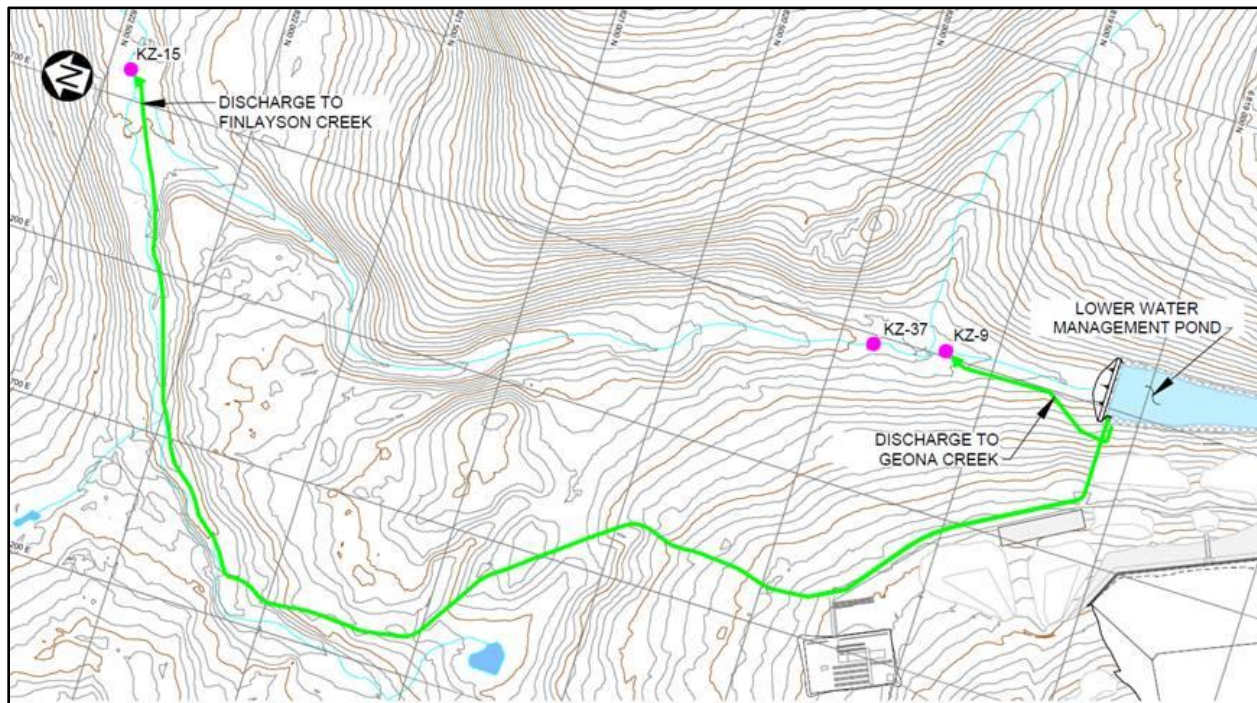
| Constituent       | Site Specific Water Quality Objectives (mg/L)                                                      |                                                                   |                                                                   |                  |
|-------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------|------------------|
|                   | KZ-13                                                                                              | KZ-37                                                             | KZ-15                                                             | KZ-26            |
| Arsenic, Total    | 0.037                                                                                              | 0.037                                                             | 0.037                                                             | 0.037            |
| Iron, Total       | 0.36                                                                                               | 0.91                                                              | 0.32                                                              | 0.81             |
| Fluoride          | 1.1                                                                                                | 1.1                                                               | 1.1                                                               | 1.1              |
| Selenium, Total   | 0.002 mg/L at sulphate ≤60 mg/L; and<br>(0.1736*[sulphate]^0.597)/1000 (mg/L) at sulphate >60 mg/L |                                                                   |                                                                   |                  |
| Copper, Dissolved | See<br>Table 4-6                                                                                   | 0.00134 mg/L Nov to<br>Apr; FWQG in Table<br>4-6 for other months | 0.00117 mg/L Jan to<br>Mar; FWQG in Table<br>4-6 for other months | See<br>Table 4-6 |

#### 4.4 DISCHARGE PROTOCOLS

The Project site is predicted to typically operate with a water surplus, meaning that more water is produced than is consumed, as described in additional detail in Section 5.1. Site surplus water will be discharged from the LWMP to Geona Creek and Finlayson Creek. Discharge node locations in the Life of Mine Water (LOM) Balance Model (WBM) and the Water Quality Model (WQM) are KZ-9 (Geona Creek) and KZ-15 (Finlayson Creek) as shown on Figure 4-1.

The maximum rate of water discharge from the LWMP to the receiving environment at KZ-9 in Geona Creek and at KZ-15 in Finlayson Creek is determined by the following ratios of natural streamflow to discharge flow:

- KZ-37: 2.6:1
- KZ-15:
  - Year 1 to Year 3: All months: 4:1
  - Year 4 onwards:
    - April to February: 4:1
    - March: 4.9:1



**Figure 4-1: Discharge Node Locations**

## 5. SURFACE WATER AND GROUNDWATER MODELLING

Several models have been developed to evaluate current and predicted future water quantity and quality conditions throughout the Project phases. These models include:

- Updated WTP Effluent Predictions (BQE, 2019a);
- Baseline Watershed Model (KP, 2024d);
- Life of Mine Water Balance Model (KP, 2024a);
- Water Quality Model (Ensero, 2024b) and
- Conceptual and numerical groundwater models (KP, 2024b; Tetra Tech EBA, 2019).

These models are structured to provide dynamic spatial and temporal modelling frameworks to represent various physical conditions and simulate changes to the hydrologic regime over the life of the Project. The modelling results provide input to the development and implementation of water management planning for the Project. This section describes each model and summarizes relevant results that contributed to the development of the integrated site WMP described herein.

### 5.1 LOM WATER BALANCE MODEL

The LOM Water Balance Model was developed to simulate the WMP and the movement of surface water and groundwater through the life of the Project (i.e., Construction, Operations and Closure phases) (KP, 2024a). The surface water and groundwater flow estimates simulated using the LOM Water Balance Model were used as inputs to the Water Quality Model (discussed in Section 5.2) and to support water management planning.

The LOM Water Balance Model was developed using the *GoldSim* modelling platform. Climate inputs to the LOM Water Balance Model include temperature and precipitation data developed using the 51-year synthetic historic climate record of complete years that extends from 1972 to 2022 (KP, 2024a). The model simulates groundwater and surface water flows in the Project area and in the downstream receiving environment.

A Variable Climate Case (VCC) model was developed using the LOM Water Balance Model to assess the potential effects of climate variability on the surface water and groundwater flows and the WMP. The VCC model is comprised of 51 separate model iterations with each simulation generated by incrementally stepping through the long-term climate record thereby preserving the inherently cyclical nature of the climate record including wet and dry cycles, while creating 51 unique sets of water balance model results for each month of each year of the Project life. The VCC model was used to assess potential variability of pond volumes and Water Treatment Plant (WTP) influent rates under the influence of a variable climate.

Water flows through the following facilities were explicitly simulated: Process Plant, Class A, B, and C Storage Facilities, Pit Rim Pond, Overburden Stockpile, Low Grade Ore (LGO) Stockpile and Run of Mine (ROM) Pad, WTP, all site water collection ponds, collection ditches, and diversion channels.

Flow schematics showing water pathways to and from each water management facility during all Project phases are provided in the LOM Water Balance Report (KP, 2024a). Flows were evaluated for the Base (average climate) Case, the VCC, dry and wet year scenarios, and a number of sensitivity cases to climate change, runoff coefficient and mine dewatering rates.

The LOM Water Balance Model and its results are described in detail in the LOM Water Balance Model Report (KP, 2024a). The LOM Water Balance Model results indicate that the Project will operate in an annual surplus and that the WMP achieves the objectives stated in Section 2.1 across a broad range of weather and climate scenarios. The annual surplus volumes indicated in the model were used to inform the calculation of the discharge ratios detailed in Section 4.4. The model also confirms that the various site water management facilities including the WTP are appropriately designed and sized. The Adaptive Management Plan (AMP) (BMC, 2026f) details procedures for responding to unforeseen conditions in the case that water flows or storage deviate from predicted conditions in a way that could cause adverse impacts.

The LOM Water Balance Model also predicts that treated water may need to be held in the LWMP during the low flow winter period, particularly during operating years with higher mine dewatering requirements to achieve the target discharge volume ratios specified throughout the year. This is described in additional detail in Chapter 9 of this document.

## 5.2 WATER QUALITY MODEL

The Project Water Quality Model (WQM) (Ensero, 2024b) was developed based on the results of the updated LOM Water Balance Model Report (KP, 2024a). The WQM predicts the water quality of Constituents of Potential Interest (COPIs) in the drainage from the Project facilities for each Project phase. Geochemical mass loading rates were estimated for each Project facility throughout each Project phase and combined with modelled flow rates to calculate water quality predictions from individual Project facilities and, ultimately, for the receiving environment.

The model was developed using the *GoldSim* modelling platform. Water quality modelling was performed on a monthly time step through the Construction, Operations, and Closure phases of the Project to estimate seasonal variation. Additionally, three precipitation scenarios were modelled to undertake a sensitivity analysis in several important years (at least one year in each phase) throughout the Project:

- Mean Annual precipitation (i.e., an “average” year);
- One in 50 (1/50) wet year; and
- One in ten (1/10) dry year.

The alternate scenarios for the wet and dry conditions were used to analyse the sensitivity of the WQM to a range of flow scenarios that may occur over the life of the Project. The one in 50 year wet case was selected to assess conditions that may occur during the entire life of the Project (from Construction through Closure). The one in 10 dry year scenario was selected based on the Operations phase of the Project as being less than 10 years and previous Water Licence applications (QZ18-044

and QZ09-092-2) utilizing the one in 10 dry year to determine effluent quality standards for the discharge locations.

An additional one in 20 dry year scenario was investigated based on discussions with stakeholders for the Project and was used for comparison purposes with the one in 10 dry year only. These cases are considered typical for a range of climatic conditions for which to assess water quality for mining projects in the Yukon.

The model incorporates data from groundwater and surface water quality baseline monitoring, meteorological studies, site water balance data, hydrogeological modelling, and laboratory-based geochemical testing of trace element leaching from site material. Multiple sets of source terms were developed to predict neutral and acidic waste rock drainage chemistry throughout the course of the Project. For each of these, a base case representing most likely conditions (the Base Case), and a likely worst case assuming elevated weathering rates (the Upper Case), was developed:

- Base Case source terms used the median of the last 20 weeks of kinetic test loading rates, reflecting steady state conditions observed in the kinetic tests; and
- The more conservative Upper Case source terms used the 75<sup>th</sup> percentile of the weekly loading rates for each kinetic test, reflecting an increased weathering rate that may be expected from freshly exposed material.

During Construction, COPI concentrations in Geona Creek and Finlayson Creek receiving environment were predicted to generally be similar to, or slightly lower than baseline concentrations due to the diversion of upstream waters (i.e. Fault Creek) and dilution from discharge of the ABM open pit dewatering water for all precipitation scenarios. No WQO exceedances were predicted for the Base Case.

No WQO exceedances were predicted for Geona Creek for the Upper Case. A slight exceedance of the total iron WQO was predicted for the Upper Case in upper Finlayson Creek (KZ-15) for one month only (0.37 mg/L vs 0.32 mg/L WQO) during Construction. The Fault Creek diversion resulted in increased concentrations of selenium, cadmium and zinc in South Creek (KZ-13), but with no WQO exceedances.

During Operations, predicted COPI concentrations in the LWMP discharge increase through the Project life, reflecting increases in load contribution from pit wall runoff as the ABM open pit is expanded. No COPI concentrations were predicted to exceed their respective WQOs in the receiving environment under any precipitation scenario for the Base Case source terms.

No WQO exceedances were predicted for the Upper Case during Operations for the Mean Annual Precipitation or wet year scenarios. For the Upper Case in the dry year scenario, assuming no implementation of the AMP (BMC, 2026f), total uranium concentrations in Geona Creek (KZ-37) are predicted to exceed the WQO for 5 months in the final year of Operations (maximum concentration of 0.023 mg/L vs 0.015 mg/L WQO), and dissolved copper concentrations are predicted to exceed WQO by 7% in the final month of Operations only at KZ-37. In practice, these concentrations would trigger the AMP and adaptive management procedures would be implemented, ensuring that there is no WQO exceedance.



Details of the WQM results for the Closure phases are summarized in the Reclamation and Closure Plan (BMC, 2026a).

The WQM Report provides details on model inputs, the modelling timeline, mass transport layouts and load calculations, and detailed summaries of results (Ensero, 2024b).

### 5.3 STORM WATER MODEL

A Storm Water Model (hydrological model) was developed to estimate the inflow design flood hydrographs (defined as part of the Design Criteria described in Section 4.1) for the diversion channels, collection ditches, and the water management facilities capacities and spillways throughout the Project area. The hydrological model was developed using HEC-HMS software (v4.2.1). The model was calibrated based on streamflow data for the Project (KP, 2019a) and included the United States Department of Agriculture (USDA) Soil Conservation Service (SCS) rainfall distribution curve (USDA, 1986), and the SCS curve number value. The time of concentration was determined using the SCS curve number/lag time equation (USDA NRCS, 2010). The storm storage requirements for each water management facility were evaluated using the calibrated HEC-HMS model. The water management facilities simulated included the UWMP, LWMP, Class A, B, and C Storage Facility Collection Ponds, the Overburden Stockpile Collection Pond, and the Pit Rim Pond. The maximum operational volumes of the ponds have been defined and verified using the LOM Water Balance Model and VCC Model discussed in Section 5.1, while the storm storage volumes are considered in addition to the maximum operational volume and have been calculated using the hydrological model. The operational and storm storage volumes for water management ponds site wide are presented in Table 5-1.

**Table 5-1: Water Management Facility Design Volumes**

| Water Management Structure                            | Maximum Operational Pond Volume (m <sup>3</sup> ) | Storm Storage Allowance (m <sup>3</sup> ) | Total Pond Volume (m <sup>3</sup> ) | Freeboard (m) |
|-------------------------------------------------------|---------------------------------------------------|-------------------------------------------|-------------------------------------|---------------|
| Class C Storage Facility Collection Pond <sup>1</sup> | 15,400                                            | 30,000                                    | 45,400                              | 1.0           |
| Overburden Stockpile Collection Pond <sup>1</sup>     | 12,300                                            | 2,300                                     | 14,600                              |               |
| Class A Storage Facility Collection Pond              | 2,000 <sup>2</sup>                                | 88,000                                    | 90,000                              | 1.0           |
| Class B Storage Facility Collection Pond              | 2,000 <sup>2</sup>                                | 64,000                                    | 66,000                              |               |
| Upper Water Management Pond                           | 250,000                                           | 52,200                                    | 302,200                             | 1.0           |
| Lower Water Management Pond                           | 500,000                                           | 54,300                                    | 554,300                             |               |
| Pit Rim Pond                                          | 57,600                                            | 2,400                                     | 60,000                              | 1.0           |

<sup>1</sup> Based on storage volume below low-level outlet.

<sup>2</sup> The pond will be maintained as dry as possible. Temporary water accumulation is anticipated during regular precipitation events. The volume accumulated from these events will be dewatered over a matter of days. A sump will be required to facilitate pumping operations.

## 5.4 GROUNDWATER MODEL

Conceptual and numerical groundwater models were developed to evaluate current and predicted future groundwater conditions associated with the Project (KP, 2024b; Tetra Tech EBA, 2019). The conceptual groundwater model summarizes the groundwater regime, forming the basis of the numerical groundwater model and supporting the development of groundwater-related mitigation measures. The numerical groundwater model was developed using the MODFLOW-SURFACT modelling code using the graphical user interface developed by HydroGeoLogic Inc. (2017).

The groundwater models were developed to assess the groundwater regime during Baseline, Operations, and Closure phases. Steady-state and transient numerical groundwater flow models were first constructed and calibrated to replicate baseline hydrogeological conditions. The baseline models were calibrated to pre-mining water level elevations, Geona Creek base flows, and long-term aquifer tests.

The baseline numerical groundwater model was modified to represent development of the ABM open pit, underground workings, and surface waste and water management facilities. Model simulations were conducted to assess mine dewatering strategies and the associated extent of water level drawdown surrounding the mine. For the Closure phases, model simulations were conducted to assess the rate of ABM Lake filling and the surface water and groundwater flows into and out of ABM Lake, once full. Model simulations were conducted to evaluate potential seepage pathways and travel time from the pit, the storage facilities, and the water management ponds during Closure.

Tetra Tech EBA Inc. (2019) provides details on the numerical groundwater model development, model calibration, and detailed summaries of results for dewatering, seepage, and ABM lake filling analyses. Additional site investigations were conducted in 2024 and will continue in subsequent years prior to construction to improve hydrogeological characterization in support of groundwater model updates and Detailed Design of Project infrastructure.

## 6. SITE WATER MANAGEMENT

Figure 6-1 shows the layout of the Project footprint during Construction. Figure 6-2 shows the Project footprint at the time of Process Plant start-up. Figure 6-3 shows the Project footprint in early Operations, and Figure 6-4 shows the final, full Project layout at the end of Operations, not taking into account any progressive reclamation. The water management facilities layouts for the Active, Transition and Post-closure phases are presented in the Reclamation and Closure Plan (BMC, 2026a).

Figure 6-5 through Figure 6-8 show site water management flow schematics for Construction and Operations, illustrating the expected most likely and/or typical water management flows. In practice, water at the site will be managed to effectively and efficiently meet the objectives presented in Section 2.1, which at times may result in water management flows that differ from those shown in Figure 6-5 through Figure 6-8.

### 6.1 SEQUENTIAL MINE DEVELOPMENT

The LOM Water Balance Model (KP, 2024a) simulates the water management flows, surface water and groundwater flows during all phases of the Project. Project Construction and Operations are summarized in this Water Management Plan and Closure is summarized in the Reclamation and Closure Plan (BMC, 2026a).

#### 6.1.1 Construction

A flow schematic for Construction is provided as Figure 6-5. The following general construction and water management activities, occur during the Construction phase:

- The initial priority is to construct diversion channels to direct non-contact water around Project facilities prior to significant ground disturbing activities occurring. Non-contact diversion channels discharge to Geona Creek downstream of the future LWMP and South Creek;
  - Diversions to direct runoff around the ABM open pit area, including the Fault Creek Diversion Channel, Open Pit South Diversion Channel, Open Pit North Diversion Channel, and Geona Creek Diversion Channel will be constructed to reduce water flow into the Project area;
  - Diversion channels to direct runoff around the Class A, B, and C Storage Facilities, including the East Diversion Channel and the Tote Road Diversion Channel will be constructed prior to placement of material in the Waste Rock Storage Facilities.
- Commencement of dewatering of overburden in the ABM open pit area facilitated by trenches will commence when diversions are constructed. Overburden dewatering is pumped to the Pit Rim Pond for sediment removal prior to discharge to Geona Creek;
- Pre-stripping of overburden at the ABM open pit begins and is stored in the Overburden Stockpile;



- Collection ponds to collect and remove sediment from runoff leaving the Class C Storage Facility and Overburden Stockpile will be constructed. Runoff from both ponds is directed to Geona Creek;
- The Class A and B Collection Ponds and LWMP will be constructed and are operated as flow-through ponds that do not retain water; and
- The Class A Storage Facility buttress will be partially constructed.



FIGURE 6-1: GENERAL ARRANGEMENT - CONSTRUCTION PHASE

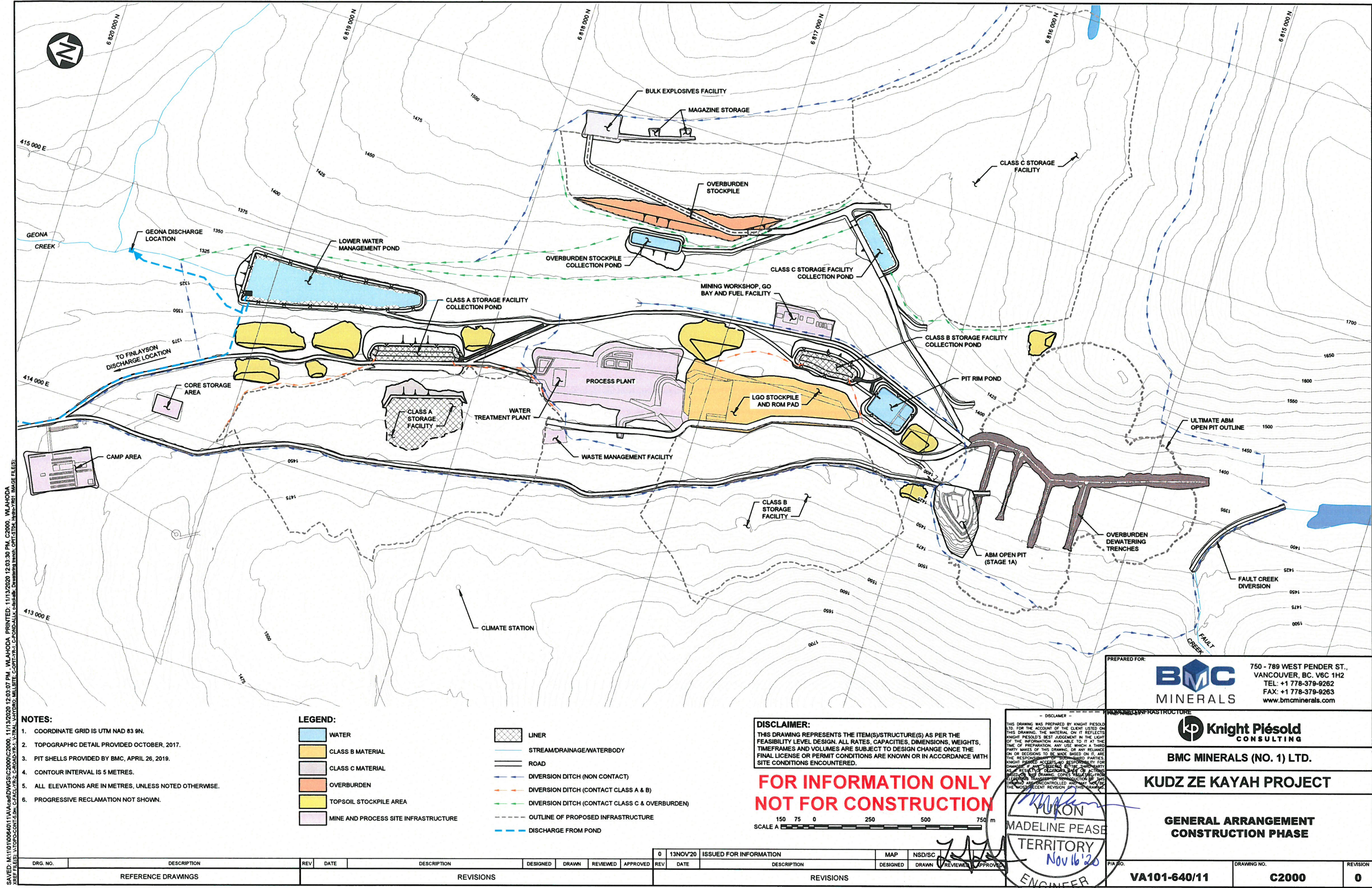
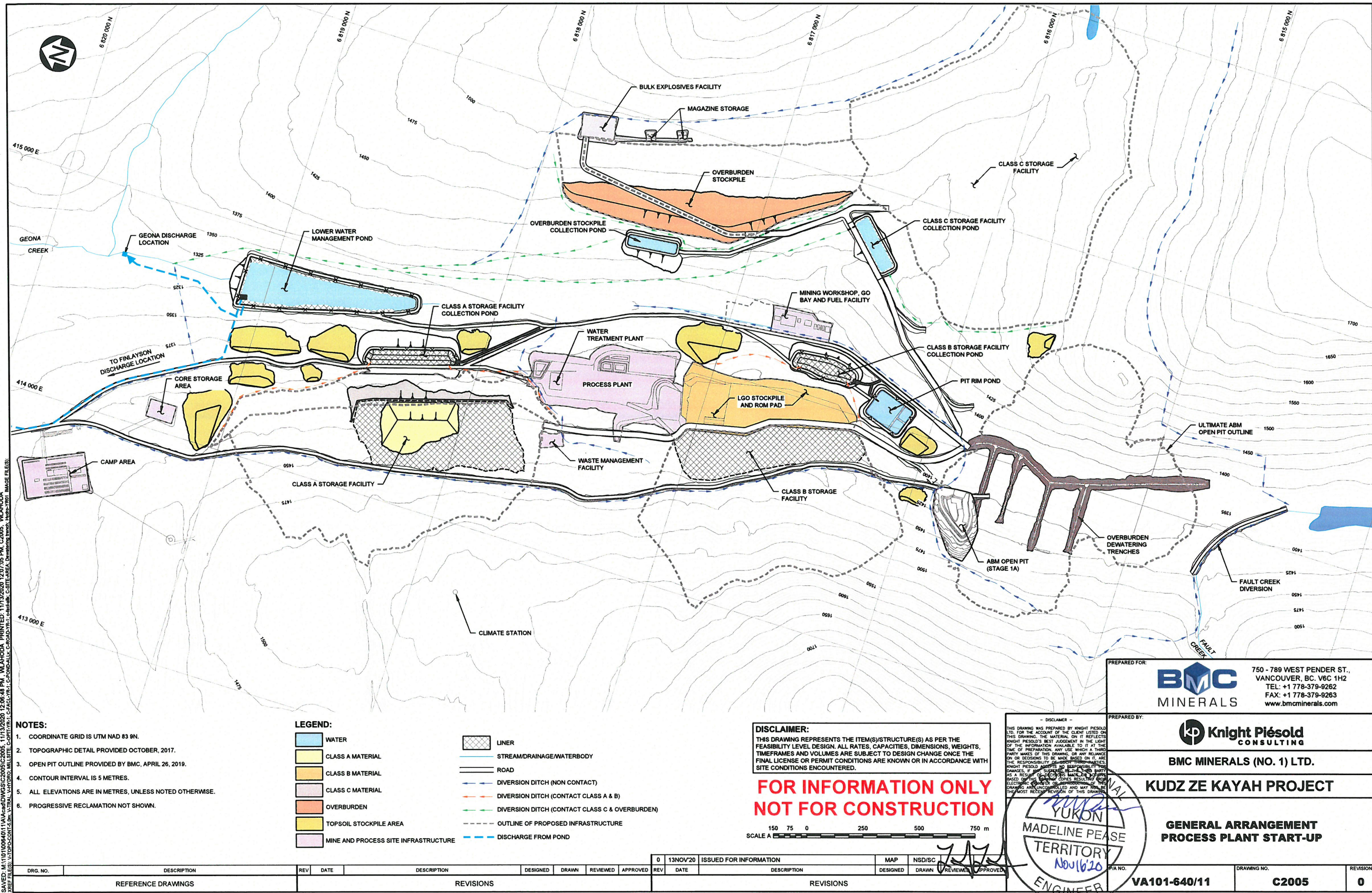




FIGURE 6-2: GENERAL ARRANGEMENT - PROCESS PLANT START-UP





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| REFERENCE DRAWINGS |             |  |  | REVISIONS |      |             |  |  |          |       |          | REVISIONS              |     |      |             |     |     |           |          | VA101-640/11 |          |          |         | C2010       |          | 0 |



**NOTES:**

- COORDINATE GRID IS UTM NAD 83 9N.
- TOPOGRAPHIC DETAIL PROVIDED OCTOBER, 2017.
- PIT SHELLS PROVIDED BY BMC, APRIL 26, 2019.
- CONTOUR INTERVAL IS 5 METRES.
- ALL ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
- PROGRESSIVE RECLAMATION NOT SHOWN.
- THIS DRAWING REPRESENTS THE FEATURE/STRUCTURE TO DESIGN-LEVEL ACCURACY, AND IS SUBJECT TO MODIFICATIONS DURING CONSTRUCTION IN ACCORDANCE WITH EITHER A) INFORMATION GAINED FROM GEOTECHNICAL INVESTIGATIONS, OR B) AS A RESULT OF MODIFICATIONS MADE TO OTHER STRUCTURES/FEATURES THAT ARE CONNECTED.

**LEGEND:**

- WATER
- CLASS A MATERIAL
- CLASS B MATERIAL
- CLASS C MATERIAL
- OVERBURDEN
- TOPSOIL STOCKPILE AREA
- OPEN PIT
- MINE AND PROCESS SITE INFRASTRUCTURE
- LINER
- STREAM/DRAINAGE/WATERBODY
- ROAD
- DIVERSION DITCH (NON CONTACT)
- DIVERSION DITCH (CONTACT CLASS A & B)
- DIVERSION DITCH (CONTACT CLASS C & OVERBURDEN)
- OUTLINE OF PROPOSED INFRASTRUCTURE
- DISCHARGE FROM POND

**DISCLAIMER:**

THIS DRAWING REPRESENTS THE ITEM(S)/STRUCTURE(S) AS PER THE FEASIBILITY LEVEL DESIGN. ALL RATES, CAPACITIES, DIMENSIONS, WEIGHTS, TIMEFRAMES AND VOLUMES ARE SUBJECT TO DESIGN CHANGE ONCE THE FINAL LICENSE OR PERMIT CONDITIONS ARE KNOWN OR IN ACCORDANCE WITH SITE CONDITIONS ENCOUNTERED.

**FOR INFORMATION ONLY  
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**PREPARED BY:** Knight Piésold CONSULTING

**BMC MINERALS (NO. 1) LTD.**

**KUDZ ZE KAYAH PROJECT**

**GENERAL ARRANGEMENT  
END OF MINE OPERATIONS**

**YUKON TERRITORY**  
MADLINE PEASE  
Nov 16 2019  
ENGINEER

| DRG. NO. | DESCRIPTION | REV                    | DATE | DESCRIPTION | DESIGNED | DRAWN | REVIEWED | APPROVED | REV | DATE | DESCRIPTION | DESIGNED | DRAWN | REVIEWED | APPROVED |
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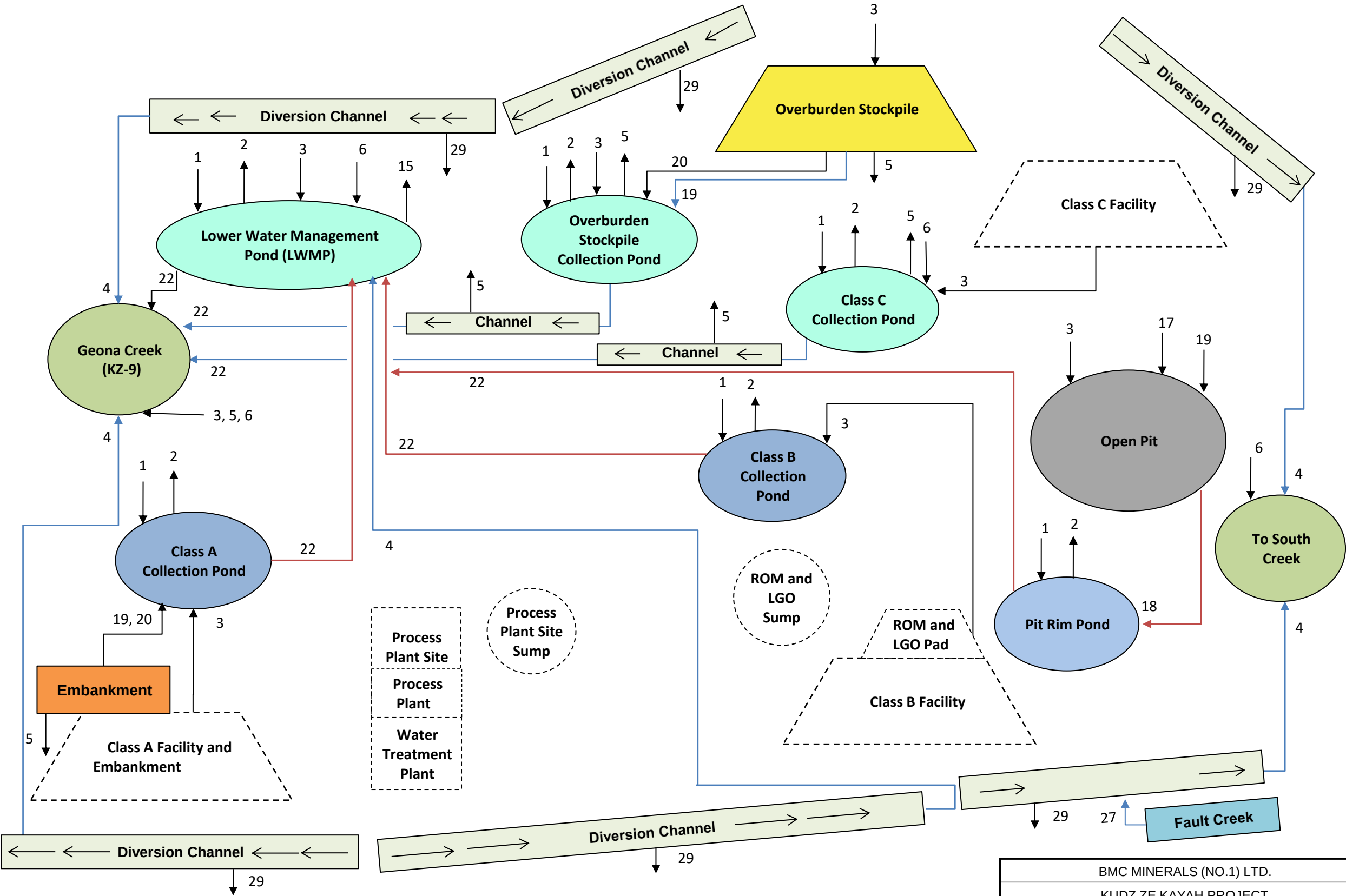
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FLOW PATHS

- 1 Net Precipitation
- 2 Evaporation
- 3 Runoff from Undiverted Area
- 4 Diverted Runoff
- 5 Seepage to Geona Creek (KZ-9)
- 6 Groundwater discharge from upstream catchment
- 7 Water in Tailings
- 8 Void Losses
- 9 Process Water from Mill to WTP
- 10 Makeup Water from LWMP
- 11 Mill Reclaim
- 12 Water in Ore
- 13 Water in Concentrate
- 14 Potable Water
- 15 Dust Suppression
- 16 Water to Paste Plant
- 17 Groundwater Inflow to Open Pit and Underground Workings
- 18 Open Pit Dewatering
- 19 Surface Runoff from Mine Facility
- 20 Toe Discharge
- 21 Seepage Collection System
- 22 Overflow from Sediment/Collection Pond
- 23 Surplus from Collection Pond to WTP
- 24 Treated Discharge from WTP
- 25 Surplus from UWMP or LWMP
- 26 Discharge from LWMP
- 27 Discharge from Fault Creek
- 28 Pit Lake Discharge
- 29 Diversion Channel Seepage to Groundwater System



**NOTES:**

1. ROM = RUN OF MINE, LGO = LOW GRADE ORE.

2. = DIVERSION OR COLLECTION DITCH, = PIPELINE, = OTHER FLOW PATHS.

3. DASHED LINES INDICATE FACILITY NOT YET CONSTRUCTED.

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| KUDZ ZE KAYAH PROJECT                     |                         |               |
| WATER BALANCE FLOW SCHEMATIC CONSTRUCTION |                         |               |
|                                           | P/A NO.<br>VA101-640/11 | REF. NO.<br>7 |
|                                           | FIGURE 6-5              |               |
|                                           |                         | REV<br>1      |

### 6.1.2 Operations

The commencement of Operations will be signalled by the Process Plant start-up. Flow schematics representing the Operations phase are provided in Figure 6-6 through Figure 6-8. The following facilities will be progressively built-out during Operations:

- ABM open pit and underground;
- Class A Buttress;
- Class A, B, and C Storage Facilities;
- Overburden Stockpile; and
- ROM and LGO Pad.

The following water management activities occur during the Operations phase:

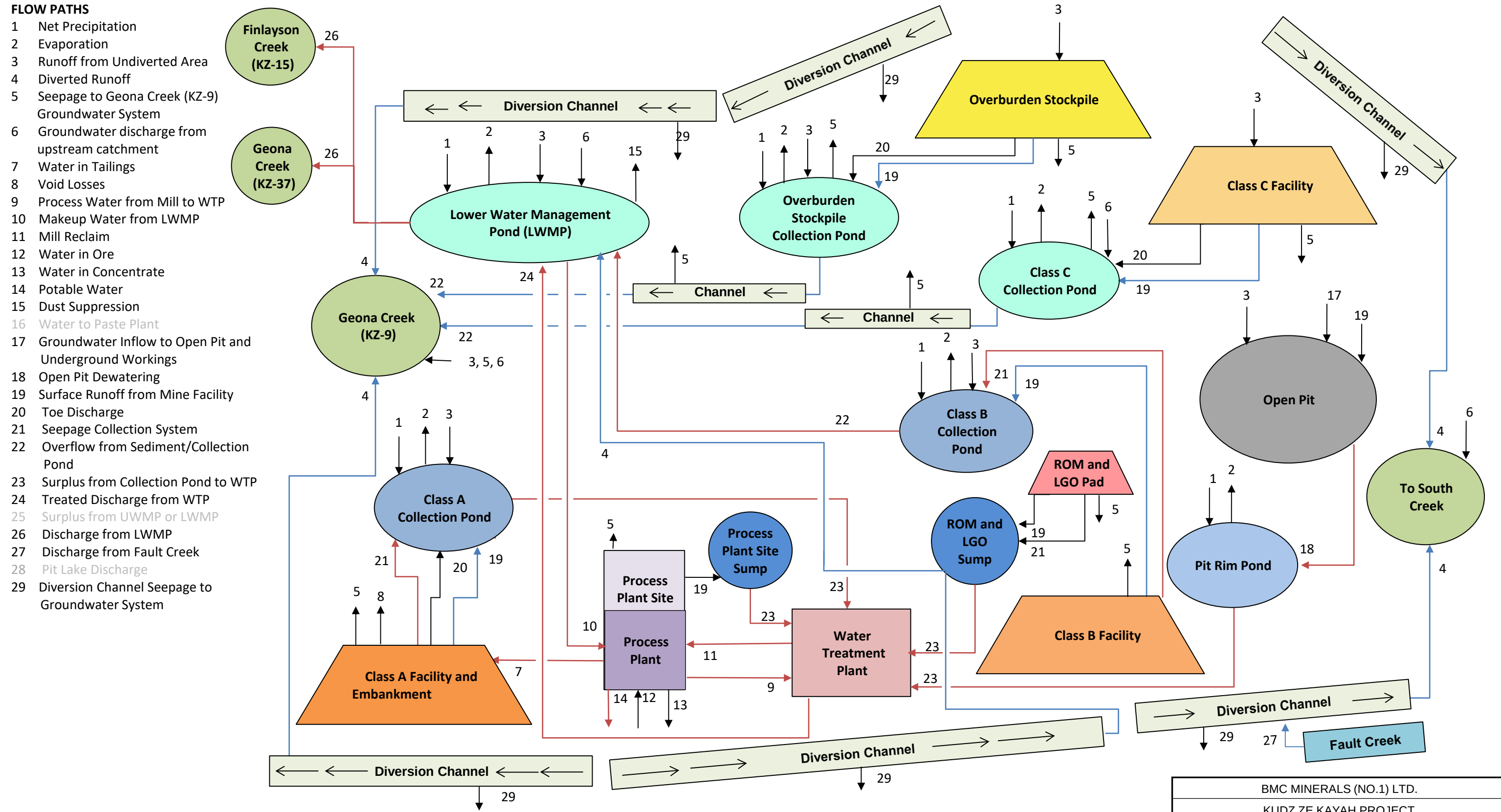
- Water collected in the Class A Collection Pond, Pit Rim Pond, ROM/LGO Sump, and Process Plant Sump is treated, as required, at the Water Treatment Plan along with process water from the Process Plant. Treated water is sent to the Process Plant and the surplus is sent to the LWMP;
- Water collected in the Class B Collection Pond will discharge to the LWMP, until the UWMP is constructed;
- Water collected in the Class C Collection Pond, and Overburden Stockpile Collection Pond is managed for sediment and discharged via gravity to Geona Creek;
- The Tote Road Diversion Channel, Geona Creek Diversion Channel, Open Pit North Diversion Channel and Open Pit South Diversion Channel are replaced by the North and South Upper Access Road Diversion Channel as Site development requires modified diversions;
- Diversion berms are progressively developed around the Class A and B Storage Facilities to divert surface runoff below the Diversion Channels around these facilities;
- The UWMP is constructed and surplus from the UWMP is pumped to the LWMP for discharge; and
- Water in the LWMP is released to Geona Creek and Finlayson Creek at two locations (KZ-9 and KZ-15) as per the discharge protocols discussed in Section 4.4.

There are many measures planned to minimize potential Project impacts to surface water and groundwater that are not detailed in this Water Management Plan. These measures are discussed in the:

- Waste Management Plan (BMC, 2026i);
- Hazardous Materials Management Plan (BMC, 2026j);
- Environmental Monitoring, Surveillance and Reporting Plan (BMC, 2026g);
- Adaptive Management Plan (BMC, 2026f);

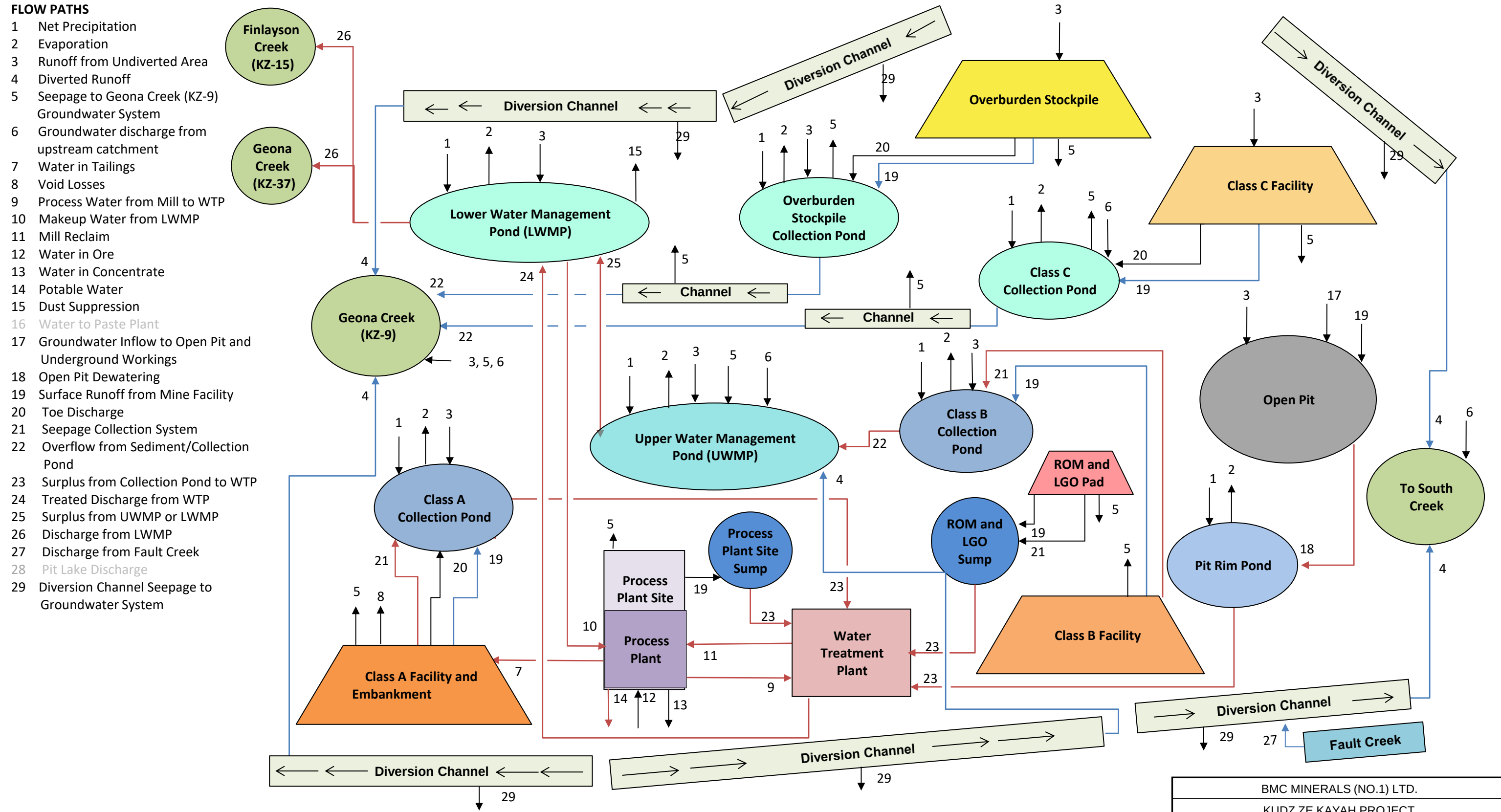
- Spill Contingency Plan (BMC, 2026k);
- Sediment and Erosion Control Plan (BMC, 2026h);
- Mine Development and Operations Plan (BMC, 2026l);
- Process Plant Development and Operations Plan (BMC, 2026m);
- Tailings Management Plan (BMC, 2026c);
- Waste Rock and Overburden Management Plan (BMC, 2026d);
- Road Construction Plan (BMC, 2026b); and
- Reclamation and Closure Plan (BMC, 2026a).





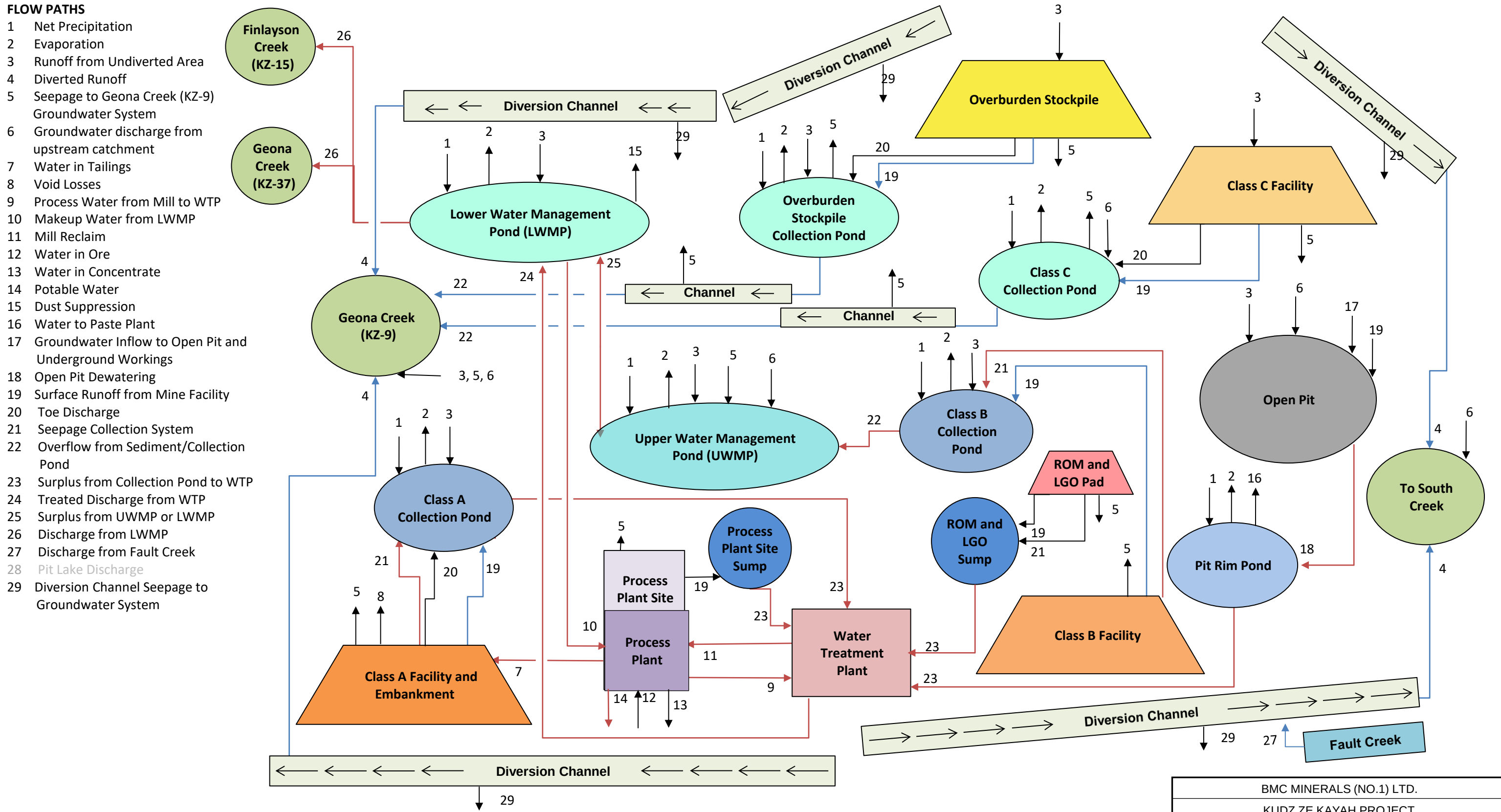
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| WATER BALANCE FLOW SCHEMATIC<br>OPERATIONS - EARLY YEAR 1 |                         |               |
|                                                           | P/A NO.<br>VA101-640/11 | REF. NO.<br>7 |
|                                                           | FIGURE 6-6              |               |
|                                                           |                         | REV<br>1      |



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| KUDZ ZE KAYAH PROJECT                               |                         |               |
| WATER BALANCE FLOW SCHEMATIC<br>OPERATIONS - YEAR 2 |                         |               |
|                                                     | P/A NO.<br>VA101-640/11 | REF. NO.<br>7 |
|                                                     | FIGURE 6-7              |               |
|                                                     |                         | REV<br>1      |



**NOTES:**

1. ROM = RUN OF MINE, LGO = LOW GRADE ORE.

2. = DIVERSION OR COLLECTION DITCH, = PIPELINE, = OTHER FLOW PATHS.

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| KUDZ ZE KAYAH PROJECT                                    |                         |               |
| WATER BALANCE FLOW SCHEMATIC<br>OPERATIONS - YEAR 3 TO 8 |                         |               |
|                                                          | P/A NO.<br>VA101-640/11 | REF. NO.<br>7 |
|                                                          | FIGURE 6-8              |               |
|                                                          |                         | REV<br>1      |

## 6.2 KEY WATER MANAGEMENT STRATEGIES

### 6.2.1 ABM Open Pit Dewatering

Key initial Construction phase water management activities will include construction of the Fault Creek Diversion and the Pit Rim Pond. Fault Creek is a tributary that currently flows north into the Project area and it will be temporarily diverted south into the South Creek catchment for the duration of Construction and Operations. The diversion of Fault Creek will reduce runoff into the ABM open pit area and facilitate ABM open pit overburden dewatering and dewatering of the Geona Creek valley between the ABM open pit and the LWMP. A portion of Fault Creek may at times be diverted back to its natural watercourse through Geona Creek to minimize unexpected effects on fish and aquatic life, as discussed in the AMP (BMC, 2026f). The Fault Creek diversion will be scheduled to minimize fluctuations during nesting periods to the extent practicable.

Tetra Tech EBA Inc. (2019) developed a numerical groundwater flow model that was used to simulate the hydrogeological response to the proposed excavation of the open pit and underground workings. The dewatering strategies, methodologies and rates described in the groundwater model are based on model predictions, and will be subject to variation pending the actual site conditions encountered during Construction and Operations, as is the norm at all open pit and underground mines operated beneath the water table.

#### 6.2.1.1 Open Pit Dewatering

The ABM open pit overburden dewatering design incorporates a series of trenches, excavated into the overburden, which will be used to collect surface and groundwater, as presented in Figure 6-1. Based on drill hole data, the overburden deposits range in thickness such that the trenches are expected to be approximately 15 to 20 m deep. Based on the ground conditions encountered, the final locations of the trenches may be slightly different than the locations shown in Figure 6-1.

The drainage trenches will be excavated within the surficial sands and gravels of the valley overburden to the bedrock. The material in this area is anticipated to be saturated and unsuitable for use as a construction material; therefore, it will be temporary stored in the Topsoil Stockpile areas and/or the Overburden Stockpile (for future use in reclamation), at the judgement of the supervising engineer.

Dewatering of the underlying weathered/fractured bedrock is anticipated to be a sustained process for the duration of Operations. Based on the results of packer tests and numerical modelling, the hydraulic conductivity of the bedrock is expected to be high enough that a set of dewatering wells will be effective in controlling water flow into the pit area (Tetra Tech EBA, 2019).

The in-pit dewatering strategy is essentially unchanged from the strategy originally proposed by Golder (1996). Competent bedrock is expected to drain naturally through the walls of the open pit. Horizontal drain holes will be installed as required in areas of high pore pressure or structural instability, as encountered during Operations. Competent, unfractured bedrock is not anticipated to generate significant rates of seepage due to its low permeability; however, it is anticipated that zones of fracturing are likely to be present and may convey higher seepage rates. Installation of horizontal



drains in these zones will be used to dissipate the hydraulic head as necessary. Drainage from the walls and horizontal drains will be conveyed to sumps located on each of the bench levels and at the pit floor. Collected water will be pumped from the sumps to the surface where it can be routed to the Pit Rim Pond.

With the exception of areas of faulting or fracturing, the bedrock is expected to be of sufficiently low permeability for seepage to be managed by collection of face drainage and horizontal drains as necessary, as mentioned above. Depending on the nature of the distribution of fracture sets or other prominent fault conduits intersecting the pit within the bedrock, additional dewatering wells around the perimeter of the pit may be installed to dewater bedrock.

#### **6.2.1.2    *Underground Dewatering***

Similar to the strategy for in-pit dewatering, the dewatering strategy for the underground workings will involve a combination of dewatering wells, drains and gravity seepage. Depending on the nature of the faults, as experienced during Project development, dewatering wells targeting the fault zones may prove important for managing water. Horizontal drains, where implemented within the underground workings, will be designed such that shallow drainage will be conducted to a local sump or containment structure to be pumped to the surface. It is anticipated that due to the likely nature of the faults to serve as hydraulic conduits connecting the workings to the recharge zones higher in the surrounding area, sustained water flow will occur.

#### **6.2.1.3    *Dewatering Management***

Water collected in the dewatering trenches will be pumped to the Pit Rim Pond, where sediment will settle out prior to discharge to Geona Creek (provided that it meets the water quality objectives at KZ-37). The ABM open pit dewatering flows during Construction are not anticipated to require additional treatment at the WTP, based on the WQM (Section 5.2). During Operations, water from the Pit Rim Pond is planned to be pumped to the WTP for treatment, dependent on water quality results as detailed in the Environmental Monitoring, Surveillance and Reporting Plan (EMSRP) (BMC, 2026g). There will be separate mechanical pumping and piping systems to convey flows from the ABM open pit dewatering and underground mining dewatering. Pipelines will be installed on the ground surface and will follow access road alignments. Pipelines will either be operated at a constant flow or batch-pumped periodically to prevent freezing of water. Anchor stakes or berms will be placed as required to restrict pipeline movement. The mechanical systems are detailed in Section 6.3.11.

#### **6.2.1.4    *ABM Open Pit Dewatering Rates***

The drainage trench excavated within the overburden is expected to produce between 60 and 94 L/s (5,200 to 8,100 m<sup>3</sup> per day) for the first six months for the purposes of overburden dewatering in anticipation of Year 1 mining. During the pre-mining period of trench dewatering, flows will primarily come from the overburden draining into the trenches.

Flow is expected to continue from the overburden during early years of open pit operations as water from the surrounding watershed flows into the overburden and enters the open pit area from the

north and south. Flows from the shallow bedrock into the pit are predicted to range from 500 to 1,600 m<sup>3</sup> per day during these first two years.

As the underground workings intercept the fault zone associated with Fault Creek, sustained flow rates of approximately 1,100 m<sup>3</sup> per day are expected throughout the mining period.

Flows into the pit and workings through the non-fault bedrock are expected to be greater during Year 3 and Year 4, and are expected to reduce to a more sustained flow rate from Years 1 through Year 9. Flows of approximately 10 to 20 m<sup>3</sup> per day are expected from the area associated with the two northern faults. Table 6-1 provides a summary of the estimated dewatering rates. The pit and underground dewatering systems will be designed and implemented to minimize groundwater extraction rates and associated water table drawdown, while achieving the conditions required for geotechnical stability and safe and effective operations.

**Table 6-1: Estimated Annual Daily Dewatering Rates**

| Time Period |             | Overburden<br>(m <sup>3</sup> /day) | Open Pit<br>Bedrock<br>(m <sup>3</sup> /day) | Open Pit<br>Fault<br>Zone<br>(m <sup>3</sup> /day) | Underground<br>Workings<br>(m <sup>3</sup> /day) | Underground<br>Workings<br>Fault<br>Zone<br>(m <sup>3</sup> /day) | Flow from<br>South Creek<br>watershed<br>(m <sup>3</sup> /day) | Annual<br>Average<br>(m <sup>3</sup> /day) |
|-------------|-------------|-------------------------------------|----------------------------------------------|----------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------|
| Pre-Mining  | First Month | 8,100                               | -                                            | -                                                  | -                                                | -                                                                 | 160                                                            | 5350                                       |
|             | Last Month  | 2,200                               | -                                            | -                                                  | -                                                | -                                                                 | 240                                                            |                                            |
| Year 1      | First Month | -                                   | 1,200                                        | -                                                  | -                                                | -                                                                 | 180                                                            | 1225                                       |
|             | Last Month  | 700                                 | 500                                          | -                                                  | -                                                | -                                                                 | (130)                                                          |                                            |
| Year 2      | First Month | 600                                 | 1,600                                        | -                                                  | -                                                | -                                                                 | (140)                                                          | 1735                                       |
|             | Last Month  | 600                                 | 1,000                                        | -                                                  | -                                                | -                                                                 | (190)                                                          |                                            |
| Year 3      | First Month | 300                                 | 2,500                                        | 40                                                 | 2,800                                            | 1,000                                                             | (30)                                                           | 5730                                       |
|             | Last Month  | <100                                | 1,700                                        | 10                                                 | 2,200                                            | 800                                                               | 140                                                            |                                            |
| Year 4      | First Month | 1,000                               | 1,000                                        | 10                                                 | 2,100                                            | 1,700                                                             | 240                                                            | 4760                                       |
|             | Last Month  | 500                                 | 600                                          | 10                                                 | 900                                              | 1,200                                                             | 260                                                            |                                            |
| Year 5      | First Month | 600                                 | 700                                          | 10                                                 | 800                                              | 1,200                                                             | 270                                                            | 3345                                       |
|             | Last Month  | 400                                 | 700                                          | 10                                                 | 600                                              | 1,100                                                             | 300                                                            |                                            |
| Year 6      | First Month | 400                                 | 1,200                                        | 20                                                 | 600                                              | 1,100                                                             | 270                                                            | 3350                                       |
|             | Last Month  | 400                                 | 700                                          | 10                                                 | 600                                              | 1,100                                                             | 300                                                            |                                            |
| Year 7      | First Month | 400                                 | 600                                          | 10                                                 | 600                                              | 1,100                                                             | 260                                                            | 2990                                       |
|             | Last Month  | 400                                 | 600                                          | 10                                                 | 600                                              | 1,100                                                             | 300                                                            |                                            |
| Year 8      | First Month | 400                                 | 600                                          | 10                                                 | 600                                              | 1,100                                                             | 250                                                            | 2985                                       |
|             | Last Month  | 400                                 | 600                                          | 10                                                 | 600                                              | 1,100                                                             | 300                                                            |                                            |

Other sources of water to the ABM open pit include surface water runoff from undiverted upslope catchment areas and direct precipitation to the pit. Modelled volumes of these sources are included in the LOM Water Balance Model (KP, 2024a) and vary based on the stage of Project development. During Year 3 when dewatering rates are highest as a result of underground development, these sources contribute approximately 940 m<sup>3</sup> per day on average.

The highest estimated daily rate of water being pumped to the Pit Rim Pond is 8,220 m<sup>3</sup> per day predicted to occur during Year 3. This rate includes dewatering of 5,830 m<sup>3</sup> per day and precipitation and surface runoff of 2,390 m<sup>3</sup> per day. All rate calculations were based on monthly averages, and daily rates are subject to fluctuations in response to short term pit seepage fluctuations, rainfall and snowmelt events, and other factors.

### **6.2.2 Tailings, Waste Rock and Overburden Management Facility Water Management**

The Class A Storage Facility, Class B Storage Facility, Class C Storage Facility and Overburden Stockpile will be expanded as necessary to manage material produced during Construction and throughout Operations. Details of the design and construction of these facilities are presented in the Tailings Management Plan (BMC, 2026c) and the Waste Rock and Overburden Management Plan (BMC, 2026d).

The Class A Storage Facility Collection Pond is located immediately downgradient of the Class A Storage Facility. The primary function of the pond is to manage seepage and runoff from the Class A Storage Facility from Construction through Operations and into Active and Transition Closure. The pond is required to be operational when Class A material is placed in the Class A Storage Facility, so it will be constructed during the Construction phase, as presented in Figure 6-1. Surface runoff from the Class A Storage Facility area will be routed to the Class A Storage Facility Collection Pond via appropriate grading of the Class A Storage Facility and collection ditches. Groundwater flows beneath the facility will be conveyed in an underdrain system to sumps downgradient of the facility and pumped to the Class A Storage Facility Collection Pond, if they do not meet WQOs for KZ-37. Water collected in the Class A Storage Facility Collection Pond that requires treatment will be pumped to the WTP for treatment then pumped to the LWMP for storage and eventual release to the environment in accordance with the discharge protocols in Section 4.4.

The Class B Storage Facility Collection Pond is located downgradient of the Class B Storage Facility. The primary function of the pond is to manage seepage and runoff from the Class B Storage Facility through Operations and into Active and Transition Closure. The pond is required to be operational when Class B material is placed to construct the foundation of the LGO stockpile and ROM pad, so it will be constructed during the Construction phase, as presented in Figure 6-1. Surface runoff from the Class B Storage Facility area will be routed to the Class B Storage Facility Collection Pond via appropriate grading of the Class B Storage Facility and collection ditches. Groundwater flows beneath the facility will be conveyed in an underdrain system to sumps downgradient of the facility and pumped to the Class B Storage Facility Collection Pond, if they do not meet WQOs for KZ-37. During Operations, water collected in the Class B Collection Pond will be pumped to the UWMP, then LWMP, and eventually released to the environment (Geona Creek or Finlayson Creek) as per the discharge protocols in Section 4.4 and as presented in the Water Quality Model (Ensero, 2024b). The Water

Quality Model indicates that water in the Class B pond during Operations will not require treatment in the WTP; however, during Active and Transition Closure, seepage from the facility is predicted to require treatment so will be routed to the WTP, as discussed in the Reclamation and Closure Plan (BMC, 2026a). Monitoring and adaptive management strategies are presented in the EMSRP (BMC, 2026g) and the AMP (BMC, 2026f).

The Class C Storage Facility Collection Pond is located immediately downgradient of the Class C Storage Facility. The primary function of the pond is to manage seepage and runoff from the Class C Storage Facility during Operations. The pond is required to be operational when Class C material is placed in the Class C Storage Facility, so it will be constructed during the Construction phase prior to Process Plant start up, as presented in Figure 6-1. Surface runoff and seepage from the Class C Storage Facility area will be routed to the Class C Storage Facility Collection Pond via gravity flow beneath the facility and the collection ditches. The pond is designed to remove sediment of 10 microns in size or larger with flows equivalent to a 1 in 10 year, 24-hour precipitation event, in accordance with BC MOE (2015). Flows will be conveyed by gravity from the Class C Storage Facility Collection Pond through an outlet ditch and discharged downstream of the LWMP into Geona Creek. The Water Quality Model (Ensero, 2024b) indicates that water in the Class C Storage Facility Collection Pond will be acceptable for discharge to the environment following sediment removal and without treatment at the WTP. Effluent from the pond will be monitored as per the EMSRP (BMC, 2026g) and adaptive management strategies will be implemented if needed as per the AMP (BMC, 2026f).

The Overburden Stockpile Collection Pond is located immediately downgradient of the stockpile to collect runoff during Construction and Operations. The pond is required to be operational when overburden material is removed from other Construction areas (primarily ABM open pit dewatering trenches and pre-stripping), so will be constructed during the Construction phase, as presented in Figure 6-1. Surface runoff from the facility will be routed to the Overburden Stockpile Collection Pond via collection ditches. The pond was designed to remove sediment of 10 microns in size or larger with flows equivalent to a 1 in 10 year, 24-hour precipitation event, in accordance with BC MOE (2015). The Water Quality Model (Ensero, 2024b) indicates that water in the Overburden Stockpile Collection Pond will be acceptable for release to the receiving environment without treatment at the WTP. Flows will be conveyed by gravity from the Overburden Collection Pond through the same outlet ditch as the Class C Collection Pond and discharged downstream of the LWMP into Geona Creek. Effluent from the pond will be monitored as per the EMSRP (BMC, 2026g) and adaptive management strategies will be implemented if needed as per the AMP (BMC, 2026f).

### **6.2.3 Surplus Water Management**

Two water management ponds will be constructed in the base of the Geona Creek Valley to manage site surplus water; the UWMP will collect runoff from much of the Project area and water pumped from the Class B Storage Facility Collection Pond, and the LWMP will be used as the final holding pond for site water prior to release to the receiving environment, use for dust control or recycle to the Process Plant as required.

The LWMP will be constructed in the Construction phase of the Project to manage site surplus water during Construction and Operations. The LWMP is located at the furthest downstream location of the Project area within the Geona Creek Valley. Construction dewatering will be required prior to



commencement of earthworks for the pond construction, and temporary sediment removal ponds will be implemented during construction of the LWMP. Once constructed, the LWMP will function as a sediment control pond during the Construction phase. Surface runoff from the Project area, except for the runoff managed at the Overburden Stockpile Collection Pond and Class C Storage Facility Collection Pond, will be collected and routed to the LWMP via collection ditches. Retention time in the pond will allow sediment to settle to meet discharge requirements. The water quality model (Ensero, 2024b) indicates that water in the LWMP will be acceptable for release to the receiving environment without treatment at the WTP during the Construction phase. Flows will be released directly downstream into Geona Creek. Effluent from the pond will be monitored as per the EMSRP (BMC, 2026g) and adaptive management strategies will be implemented if needed as per the AMP (BMC, 2026f).

Construction of the UWMP, located immediately upstream of the LWMP, will occur during the Operations phase once the Project area is dewatered to facilitate construction of the UWMP. The UWMP will be used to collect runoff from much of the Project area, and this water will be pumped to the LWMP.

During Operations, the LWMP will be used as the final holding pond for site water prior to controlled discharge to the receiving environment, use for dust control or recycling to the Process Plant, with the exception of water managed at the Class C Storage Facility Collection Pond and Overburden Stockpile Collection Pond that will be released directly to Geona Creek downstream of the LWMP. Water will be discharged from the LWMP in accordance with the discharge protocols in Section 4.4, to ensure that WQOs are met in the receiving environment (Ensero, 2024b). The UWMP and LWMP will continue to serve these functions for the remainder of the Operations phase.

Energy dissipation structures, such as rip rap channels, will be constructed below the Geona Creek and Finlayson Creek discharge locations to minimize potential erosion of the channel banks and beds.

### **6.3 WATER MANAGEMENT FACILITY DESIGN**

This section outlines the design of the water management facilities including:

- Lower Water Management Pond;
- Upper Water Management Pond;
- Class A Storage Facility Collection Pond;
- Class B Storage Facility Collection Pond;
- Class C Storage Facility Collection Pond;
- Overburden Stockpile Collection Pond;
- Pit Rim Pond;
- Diversion channels;
- Collection ditches and culverts;
- Water Treatment Plant; and

- Mechanical Water Delivery Systems.

As detailed in the Environmental Monitoring, Surveillance and Reporting Plan (BMC, 2026g) third-party engineering audits of all water management ponds will be submitted to Yukon Government, as will performance audit reports on the actual performance of these facilities related to approved and expected performance. These audits and reports will be funded by BMC and will:

- Be prepared by an independent engineer or engineering firm acceptable to the Yukon Department of Energy, Mines and Resources (EMR);
- assess whether facilities have been constructed in accordance with approved designs, permits, and specifications;
- assess the readiness of facilities to operate safely and effectively within design parameters; and
- identify any deficiencies, departures from approved designs.

The first third-party engineering audit will be submitted prior to the commencement of Operations. Where an audit identifies deficiencies or conditions requiring corrective action, BMC will address those deficiencies to the satisfaction of YG prior to commencing or continuing Operations.

### **6.3.1 Lower Water Management Pond**

Construction of the LWMP will occur during the Construction phase. The basin area of the pond will be cleared and grubbed. Any unsuitable overburden material (such as permafrost, fine-grained soil units, etc.) will be removed, and the basin excavated to a depth of approximately two metres to remove unsuitable overburden material from the shallow ponds and marshes located in the area. Temporary dewatering sumps may be required to manage flows in the Geona Creek Valley, to facilitate dewatering and earthworks in the LWMP area. A cofferdam at the location of the UWMP embankment may be constructed to act as a sediment retention and construction water management pond. Sediment and erosion control measures are described further in the Sediment and Erosion Control Plan (BMC, 2026h).

A foundation drainage system will be constructed to convey groundwater flow from the UWMP and LWMP areas, beneath the facilities, and to Geona Creek. The basin will be lined with 0.5 m of compacted glacial till and an 80 mil smooth HDPE geomembrane. The footprint of the embankment area will be excavated to a depth of approximately 10 m to a suitable foundation grade, or until bedrock is encountered. The embankment will be constructed using Class C material, and the basin liner system will be extended up the upstream face of the embankment and tied into the crest. The embankment is designed with a crest elevation of 1332.6 masl, with a total embankment height of approximately 17 m (as measured from the crest to the downstream toe). The design criteria for the LWMP are provided in Table 4-2 and design capacities are provided in Table 5-1. A section through the LWMP is presented in Figure 6-9 showing the dam crest elevation, maximum operating pond water surface elevation, the storm storage elevation, and peak water surface elevation when routing the design flood through the spillway.

An emergency spillway will be excavated into the east bank of the LWMP embankment. The spillway is designed to pass a 1 in 1,000 year, 24-hr event peak discharge with 1 m of freeboard allowance and will direct flows to Geona Creek.

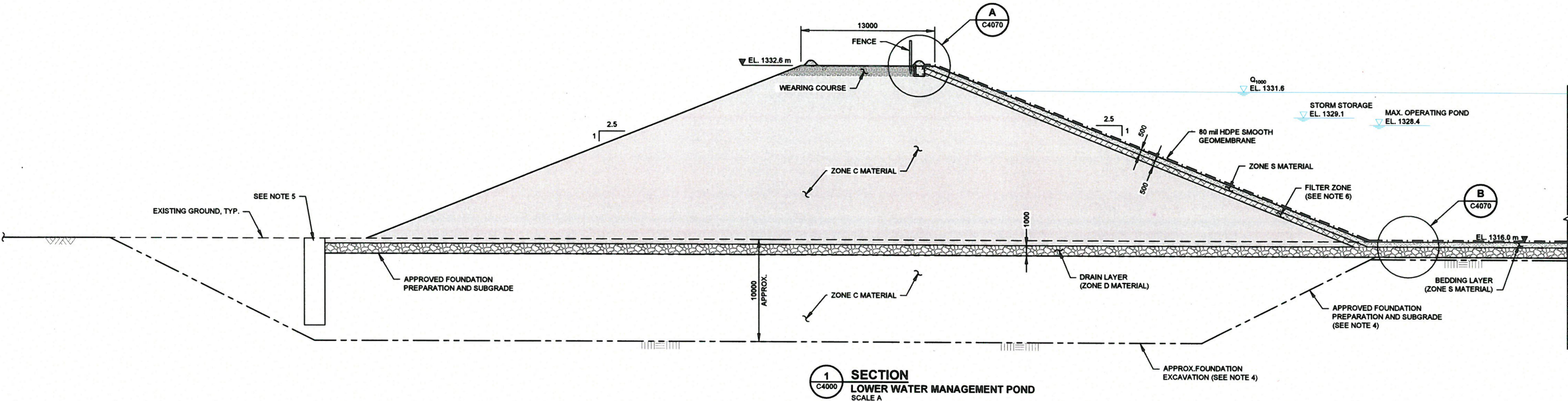
The LWMP includes a perimeter service road, to allow site personnel to inspect the pond liner and perform other monitoring and maintenance activities. Swales (gradually tapered low points in the road surface) will be constructed around the perimeter road, to allow runoff from the Project area to be collected in the pond for sediment control. Fencing will be constructed to deter wildlife from entering the pond.

The pond includes two discharge pump and pipeline systems to convey flows to Geona and Finlayson Creeks as per the discharge protocols described in Section 4.4. The pipelines will include appropriate freeze protection and will include anchor stakes or berms as required to restrict pipeline movement. These mechanical systems are detailed in Section 6.3.11.

The LWMP includes a pump (reclaim) system to pump water to the Process Plant, for re-use, if required. The reclaim pipeline includes a valve to discharge water to the UWMP, which allows water to be pumped from the LWMP to the UWMP. Pumping from the LWMP to the UWMP is not a typical operating strategy, but a contingency design consideration.



FIGURE 6-9: LOWER WATER MANAGEMENT POND - SECTION



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- LEGEND:**
- ZONE C
  - ZONE D
  - ZONE F
  - ZONE S
  - WEARING COURSE
  - HDPE GEOMEMBRANE (PROFILE)

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
  - RIPRAP ARMOURING SIZED FOR EROSION PROTECTION FOR UP TO THE  $Q_{1000}$  EVENT.
  - FOUNDATION PREPARATION WITHIN THE EMBANKMENT AND POND FOOTPRINTS TO INCLUDE FOUNDATION DRAINS TO CONVEY GROUNDWATER FLOWS DOWNSTREAM OF THE FACILITIES.
  - EXCAVATION TO COMPETENT FOUNDATION MATERIALS AS DETERMINED BY THE ENGINEER.
  - FOUNDATION DRAIN TO DAYLIGHT TO GEONA CREEK, DRAIN OUTLET TO BE FIELD FIT AS REQUIRED.
  - FILTER ZONE AS REQUIRED BASED ON GRADATION OF CLASS C MATERIAL.

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MADELINE PEASE  
TERRITORY  
Nov 16 '20  
ENGINEER**

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**KUDZ ZE KAYAH PROJECT**

**LOWER WATER MANAGEMENT POND SECTION**

PIA NO. **VA101-640/11**

DRAWING NO. **C4050**

REVISION **0**

|                    |                                                              |
|--------------------|--------------------------------------------------------------|
| C4070              | UPPER AND LOWER WATER MANAGEMENT POND - SECTIONS AND DETAILS |
| C4000              | UPPER AND LOWER WATER MANAGEMENT PONDS - PLAN                |
| DRG. NO.           | DESCRIPTION                                                  |
| REFERENCE DRAWINGS |                                                              |

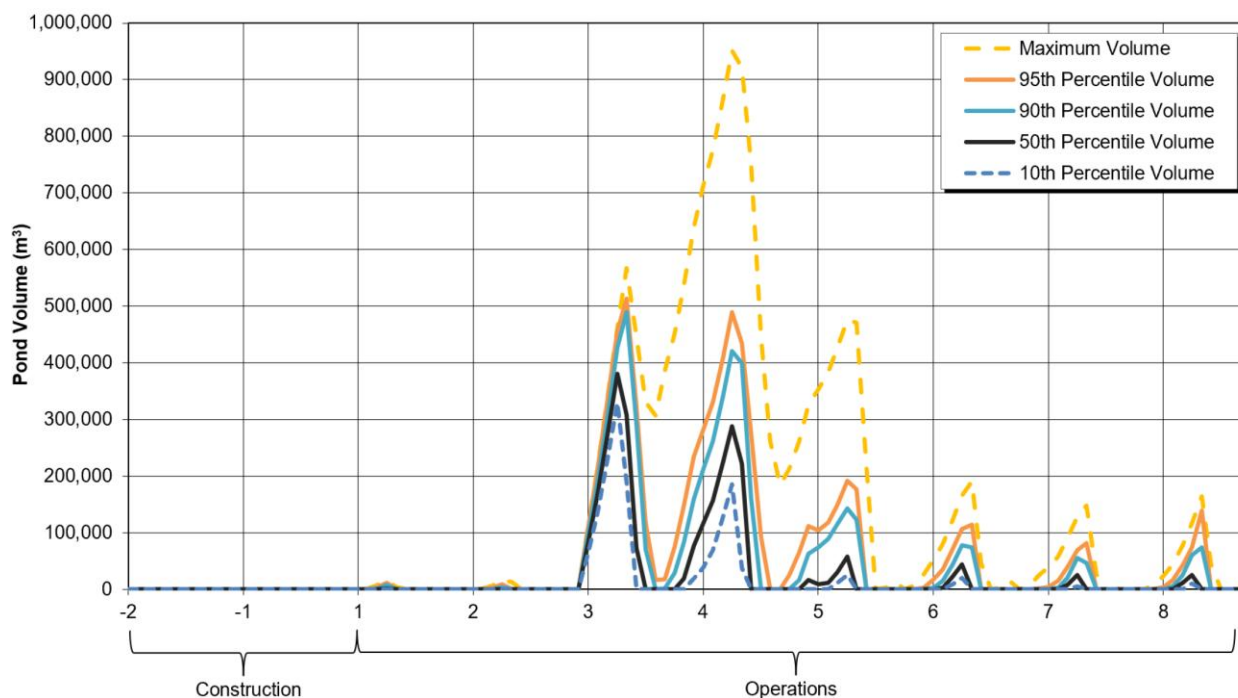
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|     |         | REVISIONS              |          |       |          |          |

| REV | DATE | DESCRIPTION | DESIGNED | DRAWN | REVIEWED | APPROVED |
|-----|------|-------------|----------|-------|----------|----------|
|     |      | REVISIONS   |          |       |          |          |



The Project is predicted to operate at most times in a water surplus, according to the LOM Water Balance Model results (KP, 2024a). The surplus magnitude will vary and will depend on many factors, including the ABM open pit and underground dewatering rates, the Project footprint, and climate conditions. The surplus water will be collected in the LWMP and discharged to Geona Creek and Finlayson Creek, as per discharge protocols discussed in Section 4.4. Water requiring treatment will be sent to the WTP for treatment, then pumped to the LWMP.

The predicted range of water stored in the LWMP under variable climate conditions is presented in Figure 6-10. Results are presented for the predicted 10<sup>th</sup>, 50<sup>th</sup>, and 90<sup>th</sup> percentile pond volume and the maximum pond volume.



**Figure 6-10: Lower Water Management Pond Operational Volume Range**

The model predicts that maximum water storage is expected in the spring of Year 3 and Year 4 when mine dewatering rates are highest and natural streamflows are relatively low, limiting the discharge rate to Geona and Finlayson Creeks. The VCC Model predicts that the 95<sup>th</sup> percentile volume of water held in the LWMP would remain less than the maximum operational pond volume of 500,000 m<sup>3</sup>, meaning that there's an approximately 5% chance of the maximum operational volume of the LWMP being exceeded during Project Operations. If this were to happen, multiple potential management approaches have been identified to ensure that the minimum storm storage is maintained in the LWMP, as discussed in the AMP (BMC, 2026f).

Dewatering rates from the ABM open pit and underground mine are the largest source of water to the LWMP during the winter months. If the adaptive management initiative for pit dewatering is triggered, management options to reduce the stored water in the LWMP include holding water in the

UWMP prior to pumping to the LWMP or temporarily decreasing dewatering flows from the underground and ABM open pit mine, among other approaches.

### **6.3.2 Upper Water Management Pond**

Construction of the UWMP will occur during the Operations phase. It is anticipated that the foundation area of the pond will be partially dewatered because it is constructed later in the Project life; however, temporary dewatering strategies may be required to facilitate earthworks in the UWMP area as per the Sediment and Erosion Control Plan (BMC, 2026h). A temporary cofferdam upstream of the UWMP may be constructed to provide a dewatered working area.

The basin area of the pond will be cleared and grubbed. Any unsuitable overburden material (such as permafrost, fine-grained soil units, etc.) will be removed, and the basin will be excavated to a depth of approximately two metres to remove unsuitable overburden material from the shallow ponds and marshes located in the area.

A foundation drainage system will be constructed to convey groundwater flow beneath the UWMP towards the LWMP and Geona Creek. The basin will be lined with 0.5 m of compacted glacial till and an 80 mil smooth HDPE geomembrane. The footprint of the embankment will be excavated to a depth of approximately 10 m to a suitable foundation grade, or bedrock is encountered. The embankment will be constructed using Class C material, and the basin liner system will be extended up the upstream face of the embankment and tied into the crest. The embankment is designed to a crest elevation of 1350.0 masl, with a total embankment height of approximately 20 m (as measured from the crest to the downstream toe). The design criteria for the UWMP are provided in Table 4-2 and design capacities are provided in Table 5-1. A section through the UWMP is presented in Figure 6-11 illustrating the dam crest elevation, maximum operating pond water surface elevation, storm storage elevation, and peak water surface elevation when routing the design flood through the spillway.

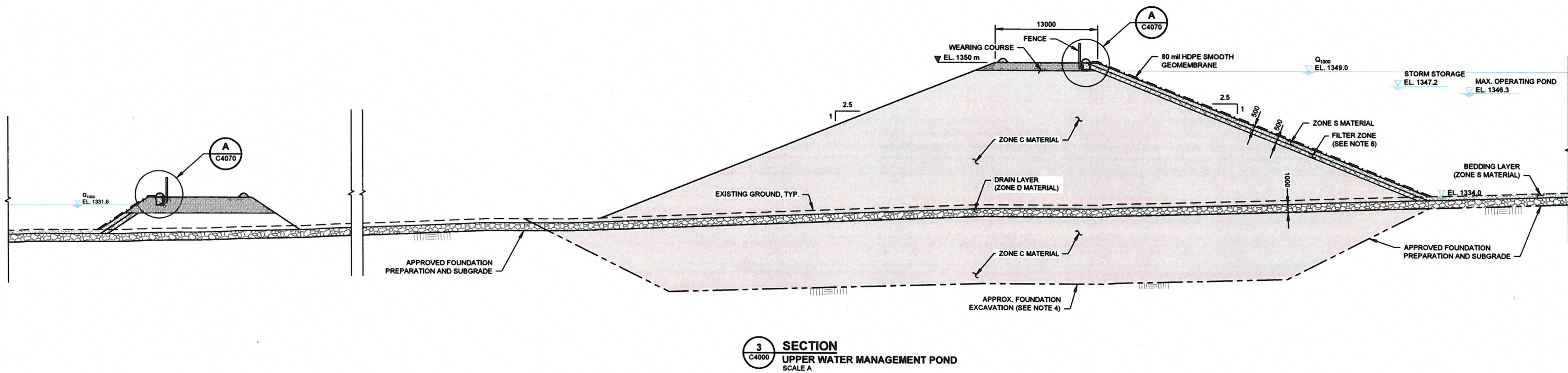
An emergency spillway will be excavated into the east bank of the UWMP embankment. The spillway is designed to pass a 1 in 1,000 year, 24-hr event peak discharge with 1 m of freeboard allowance and will direct flows directly into the LWMP.

The UWMP includes a perimeter service road to allow site personnel to inspect the pond liner and perform other monitoring and maintenance activities. Swales will be constructed around the perimeter road, to allow runoff from the Project area to be collected in the pond for sediment control. Fencing will be constructed to deter wildlife from entering the pond.

The pond includes a pump and pipeline system to discharge water from the UWMP to the LWMP, after adequate retention time in the UWMP for sediment control.

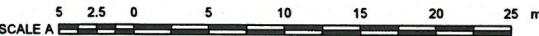


FIGURE 6-11: UPPER WATER MANAGEMENT POND - SECTION



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- LEGEND:**
- ZONE C
  - ZONE D
  - ZONE F
  - ZONE S
  - WEARING COURSE
  - HDPE GEOMEMBRANE (PROFILE)

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
  - RIPRAP ARMOURING SIZED FOR EROSION PROTECTION FOR UP TO THE  $Q_{1000}$  EVENT.
  - FOUNDATION PREPARATION WITHIN THE EMBANKMENT AND POND FOOTPRINTS TO INCLUDE FOUNDATION DRAINS TO CONVEY GROUNDWATER FLOWS DOWNSTREAM OF THE FACILITIES.
  - EXCAVATION TO COMPETENT FOUNDATION MATERIALS AS DETERMINED BY THE ENGINEER.
  - FOUNDATION DRAIN TO DAYLIGHT TO GEONA CREEK. DRAIN OUTLET TO BE FIELD FIT AS REQUIRED.
  - FILTER ZONE AS REQUIRED BASED ON GRADATION OF CLASS C MATERIAL.

YUKON  
TERRITORY  
NOV 16 2020  
ENGINEER

PREPARED FOR:

**BMC MINERALS**

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www.bmcminerals.com

PREPARED BY:

**Knight Piésold CONSULTING**

**BMC MINERALS (NO. 1) LTD.**

**KUDZ ZE KAYAH PROJECT**

**UPPER WATER MANAGEMENT POND SECTION**

PIA NO. **VA101-640/11**

DRAWING NO. **C4060**

REVISION **0**

|                    |                                                              |
|--------------------|--------------------------------------------------------------|
| C4070              | UPPER AND LOWER WATER MANAGEMENT POND - SECTIONS AND DETAILS |
| C4000              | UPPER AND LOWER WATER MANAGEMENT PONDS - PLAN                |
| DRG. NO.           | DESCRIPTION                                                  |
| REFERENCE DRAWINGS |                                                              |

| REV | DATE    | DESCRIPTION            | DESIGNED | DRAWN | REVIEWED | APPROVED |
|-----|---------|------------------------|----------|-------|----------|----------|
| 0   | 13NOV20 | ISSUED FOR INFORMATION | AS1      | SC    |          |          |
| REV | DATE    | DESCRIPTION            | DESIGNED | DRAWN | REVIEWED | APPROVED |
|     |         | REVISIONS              |          |       |          |          |

| REV | DATE | DESCRIPTION | DESIGNED | DRAWN | REVIEWED | APPROVED |
|-----|------|-------------|----------|-------|----------|----------|
|     |      | REVISIONS   |          |       |          |          |

### **6.3.3 Class A Storage Facility Collection Pond**

The Class A Storage Facility is designed to contain Class A material, which comprises filtered tailings and waste rock classified as potentially acid generating (PAG). The design of the Class A Storage Facility is detailed in the Tailings Management Plan (BMC, 2026c).

The area of the Class A Storage Facility Collection Pond will be progressively cleared and grubbed, and any unsuitable foundation material will be removed. The pond embankment will be constructed from Class C waste rock, lined with a 0.5 m layer of filter material, a 0.5 m layer of compacted glacial till material, and an 80 mil smooth HDPE geomembrane. The embankment is designed with an approximate crest elevation of 1385.0 masl, with a total embankment height of 35 m (as measured from the crest to the downstream toe). Swales on the western side of the pond will direct runoff from the collection ditches into the pond. The design criteria for the Class A Storage Facility Collection Pond are provided in Table 4-2, design capacities are provided in Table 5-1, and a plan view is presented in Figure 6-12.

A section of the Class A Storage Facility Collection Pond is presented in Figure 6-13 which shows the dam crest elevation, the storm storage elevation, and the peak water surface elevation when routing the design flood through the spillway. The Class A Storage Facility Collection Pond volume will remain as low as is practical as water will be conveyed to the WTP as it is received.

A perimeter service road will be constructed on the crest of the embankment, and an emergency spillway will be constructed in the southern end of the pond. The road will allow site personnel to inspect the pond liner and perform other monitoring and maintenance activities. Fencing will be constructed to deter wildlife from entering the pond.

The emergency spillway is designed to pass a 1 in 1,000 year 24-hr event peak discharge with a freeboard allowance of 1.0 m. The spillway chute channel for the Class A Collection Pond is designed as 5.0 m wide, 2:1 side slope trapezoidal channel with riprap armouring sized for erosion protection along its lengths and energy dissipating structures, as required. The spillway will discharge to the UWMP. Sections through the spillway and collection ditch are shown in Figure 6-14.

The Class A Storage Facility internal seepage collection system is currently designed with riser pipes extending down the upgradient slope of the Class A buttress, to discharge seepage accumulated in the foundation of the facility. Seepage is discharged to the Class A Storage Facility Collection Pond.

A pump system and pipeline will convey flows from the Class A Storage Facility Collection Pond to the WTP at the Process Plant.



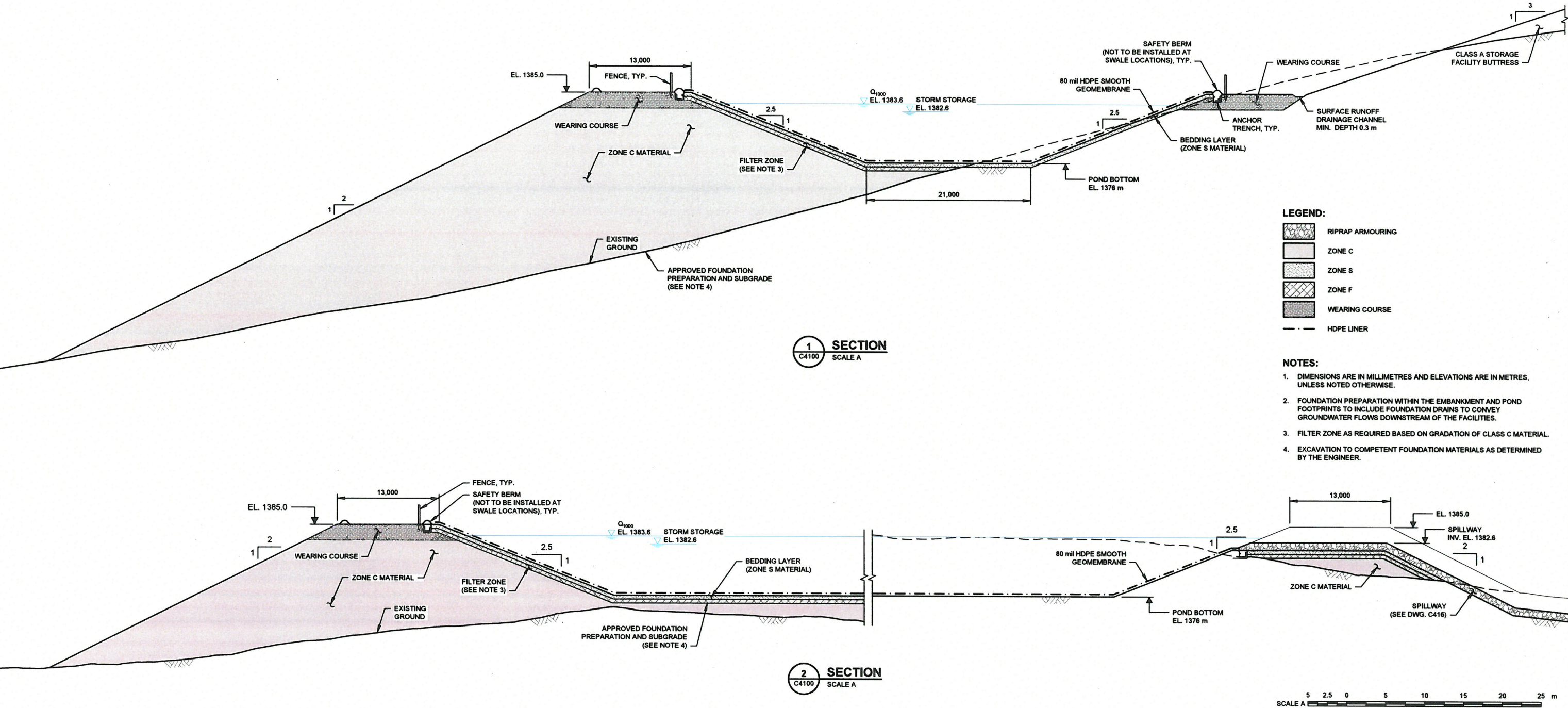
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| P/A NO.             | DRAWING NO.  | REVISION |
| <b>VA101-640/11</b> | <b>C4100</b> | <b>0</b> |



FIGURE 6-13: CLASS A STORAGE FACILITY COLLECTION POND - SECTIONS 1 AND 2



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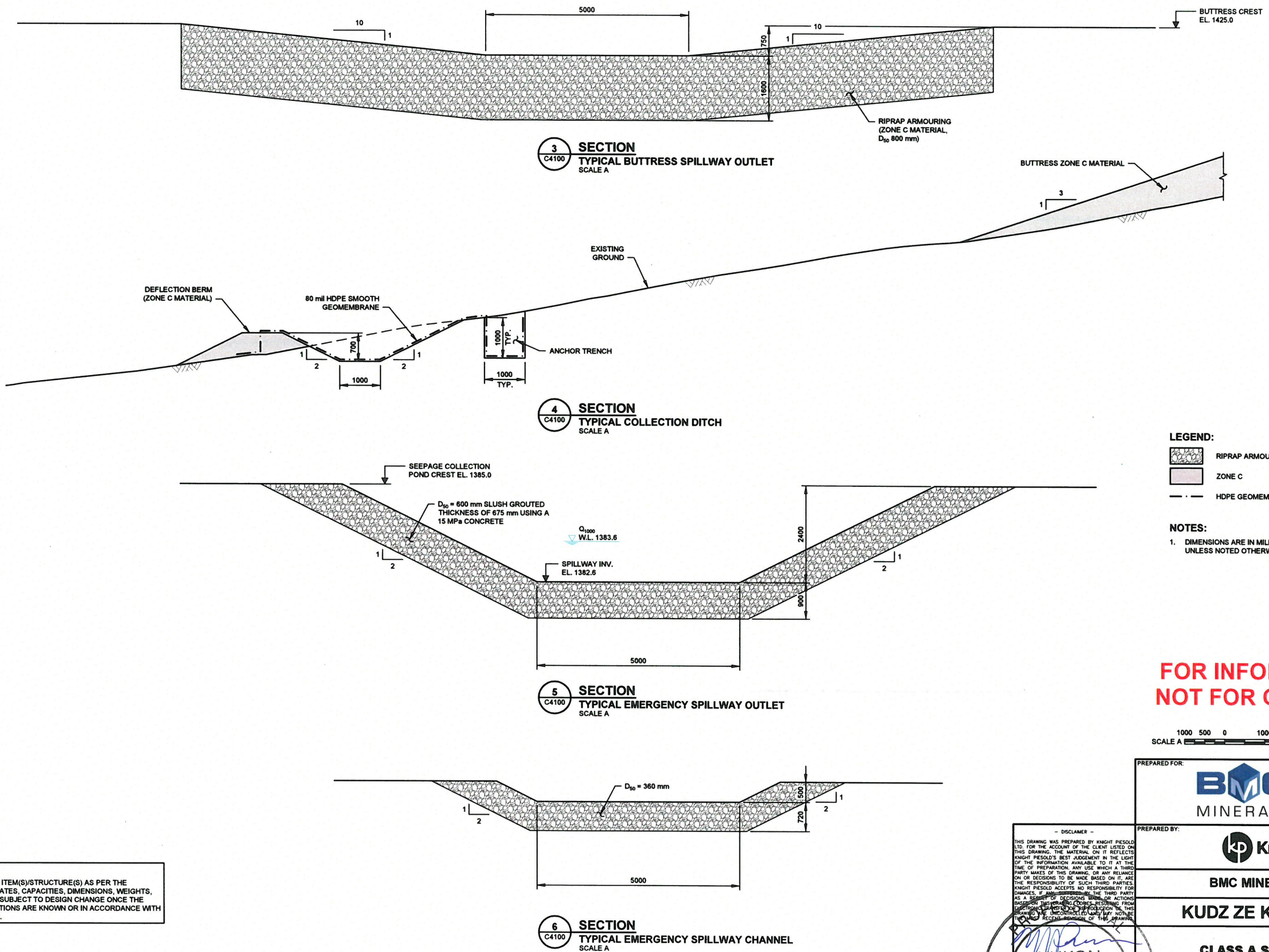
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|--------------------|--|---------------------------------------------------|--|--|--|--|--|--|--|--|--|-----------|------|-------------|--|----------|--|------------------------|-------|----------|----------|-----|------|-------------|--|-------------------------|--|-------|--|-------------|--|----------|--|----------|-------|--------------|----------|--|--|-------|--|---|--|
| C4100              |  | CLASS A STORAGE FACILITY - COLLECTION POND - PLAN |  |  |  |  |  |  |  |  |  | 0         |      |             |  | 13NOV/20 |  | ISSUED FOR INFORMATION |       |          |          | AS1 |      | NSD/SC      |  | TERRITORY<br>NOV 16 '20 |  | P/NO. |  | DRAWING NO. |  | REVISION |  |          |       |              |          |  |  |       |  |   |  |
| DRG. NO.           |  | DESCRIPTION                                       |  |  |  |  |  |  |  |  |  | REV       | DATE | DESCRIPTION |  |          |  | DESIGNED               | DRAWN | REVIEWED | APPROVED | REV | DATE | DESCRIPTION |  |                         |  |       |  |             |  |          |  | DESIGNED | DRAWN | REVIEWED     | APPROVED |  |  |       |  |   |  |
| REFERENCE DRAWINGS |  |                                                   |  |  |  |  |  |  |  |  |  | REVISIONS |      |             |  |          |  |                        |       |          |          |     |      | REVISIONS   |  |                         |  |       |  |             |  |          |  |          |       | VA101-640/11 |          |  |  | C4150 |  | 0 |  |



FIGURE 6-14: CLASS A STORAGE FACILITY COLLECTION POND - SECTIONS 3, 4, 5 AND 6

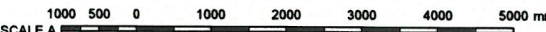


- LEGEND:**
- RIPRAP ARMOURING
  - ZONE C
  - HDPE GEOMEMBRANE

**NOTES:**

1. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

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www.bmcminerals.com

PREPARED BY:

**Knight Piesold CONSULTING**

**BMC MINERALS (NO. 1) LTD.**

**KUDZ ZE KAYAH PROJECT**

**CLASS A STORAGE FACILITY  
COLLECTION POND  
SECTIONS 3, 4, 5 AND 6**

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**YUKON TERRITORY**

**MADLINE PEASE**

**NOV 16 20**

**ENGINEER**

PIA NO.

**VA101-640/11**

DRAWING NO.

**C4160**

REVISION

**0**

|                    |                                                   |  |  |  |  |  |  |  |           |          |                        |  |  |  |     |        |           |           |          |       |          |          |         |             |  |          |              |  |       |  |   |
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| C4100              | CLASS A STORAGE FACILITY - COLLECTION POND - PLAN |  |  |  |  |  |  |  | 0         | 13NOV'20 | ISSUED FOR INFORMATION |  |  |  | AS1 | NSD/SC | TERRITORY |           |          |       |          |          |         |             |  |          |              |  |       |  |   |
| DRG. NO.           | DESCRIPTION                                       |  |  |  |  |  |  |  | REV       | DATE     | DESCRIPTION            |  |  |  |     |        |           |           | DESIGNED | DRAWN | REVIEWED | APPROVED | PIA NO. | DRAWING NO. |  | REVISION |              |  |       |  |   |
| REFERENCE DRAWINGS |                                                   |  |  |  |  |  |  |  | REVISIONS |          |                        |  |  |  |     |        |           | REVISIONS |          |       |          |          |         |             |  |          | VA101-640/11 |  | C4160 |  | 0 |

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#### **6.3.4 Class B Storage Facility Collection Pond**

The Class B Storage Facility is designed to contain waste rock classified as weakly PAG. The design of the Class B Storage Facility is detailed in the Waste Rock and Overburden Management Plan (BMC, 2026d).

The area of the Class B Storage Facility Collection Pond will be cleared and grubbed, and any unsuitable foundation material will be removed. The pond embankment will be constructed from Class C waste rock and lined with a 0.5 m layer of filter material, a 0.5 m layer of compacted glacial till material and an 80 mil smooth HDPE geomembrane. The embankment is designed with a crest elevation of 1385.0 masl, a total embankment height of approximately 17 m (as measured from the crest to the downstream toe). Swales at the north and south of the pond will direct runoff from the collection ditches into the pond. The design criteria for the Class B Storage Facility Collection Pond are provided in Table 4-2, design capacities are provided in Table 5-1 and a plan view is presented in Figure 6-15. A section of the Class B Storage Facility Collection Pond is presented in Figure 6-16 and shows the design dam crest elevation, the storm storage elevation, and the peak water surface elevation when routing the design flood through the spillway.

A perimeter road will be constructed on the crest of the embankment, and an emergency spillway will be constructed in the southern end of the pond. The service road will allow site personnel to inspect the pond liner and perform other monitoring and maintenance activities. Fencing will be constructed to deter wildlife from entering the pond.

The emergency spillway is designed to pass a 1 in 1,000 year 24-hr event peak discharge with a freeboard allowance of 1.0 m. The spillway chute channel for the Class B Storage Facility Collection Pond is designed with a 5.0 m wide, 2:1 side slope trapezoidal channel with riprap armouring sized for erosion protection along its lengths and energy dissipating structures, as required. The emergency spillway directs flows to the UWMP conveyance system.

A pump system and pipeline will convey flows from the Class B Storage Facility Collection Pond, to be discharged to the UWMP.



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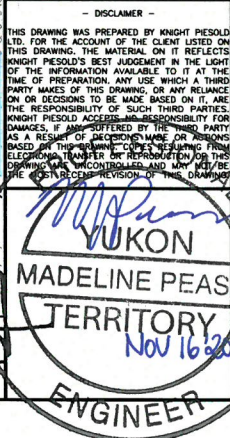
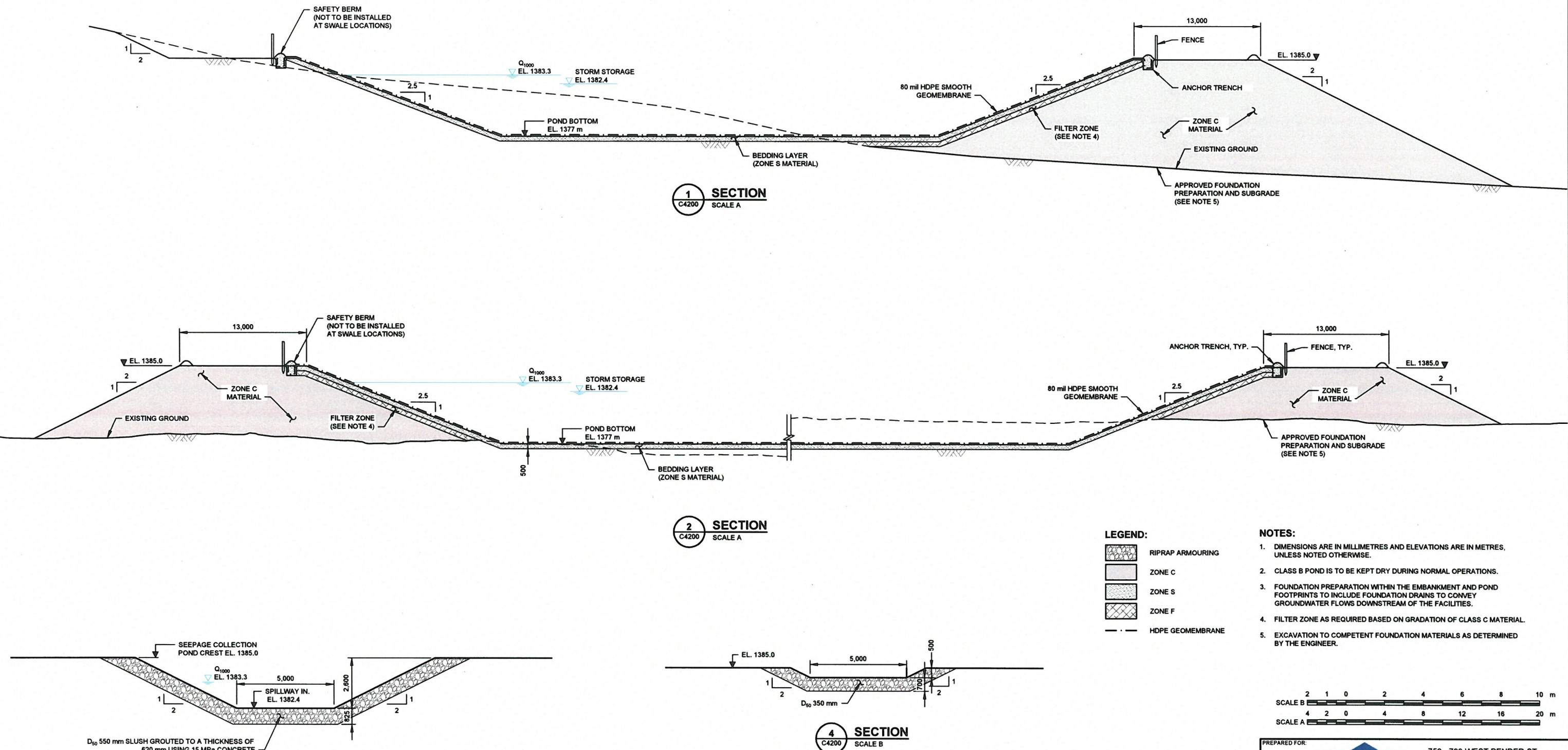




FIGURE 6-16: CLASS B STORAGE FACILITY COLLECTION POND - SECTIONS 1, 23 AND 4



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| C4200              | CLASS B STORAGE FACILITY - COLLECTION POND - PLAN |  |  |  |           |      |             |  | 0        | 13NOV'20 | ISSUED FOR INFORMATION |          |           |      | AS1         | NSD/SC |  |  |          |       |          |          |         |  |              |  |          |  |       |  |   |
| DRG. NO.           | DESCRIPTION                                       |  |  |  | REV       | DATE | DESCRIPTION |  | DESIGNED | DRAWN    | REVIEWED               | APPROVED | REV       | DATE | DESCRIPTION |        |                                                                                       |  | DESIGNED | DRAWN | REVIEWED | APPROVED | P/A NO. |  | DRAWING NO.  |  | REVISION |  |       |  |   |
| REFERENCE DRAWINGS |                                                   |  |  |  | REVISIONS |      |             |  |          |          |                        |          | REVISIONS |      |             |        |                                                                                       |  |          |       |          |          |         |  | VA101-640/11 |  |          |  | C4250 |  | 0 |

### **6.3.5 Class C Storage Facility Collection Pond**

The Class C Storage Facility has been designed to contain waste rock classified as non-PAG. The design of the Class C Storage Facility is detailed in the Waste Rock and Overburden Management Plan (BMC, 2026d).

The area of the Class C Storage Facility Collection Pond will be cleared and grubbed, and any unsuitable foundation material will be removed. The pond embankment will be constructed from Class C waste rock and lined with a 0.5 m layer of filter material, a 0.5 m layer of compacted glacial till material and an 80 mil smooth HDPE geomembrane. The embankment is designed with a crest elevation of 1446.0 masl, a total embankment height of approximately 24 m (as measured from the crest to the downstream toe). An energy dissipation structure on the southwestern side of the pond will direct runoff from the collection ditches into the pond. The design criteria for the Class C Storage Facility Collection Pond are provided in Table 4-2, design capacities are provided in Table 5-1 and a plan view is presented in Figure 6-17. A section through the Class C Storage Facility Collection Pond is presented in Figure 6-18 that indicates the design pond berm crest elevation, storm storage elevations, and the peak water surface elevation when routing the design flood through the spillway pipe.

A haul road will be constructed from the ABM open pit to the Class C Storage Facility. The haul road crosses the crest of the pond embankment to provide access to the Class C Storage Facility and to the Overburden Stockpile. A perimeter service road will be constructed around the collection pond. The service road will allow site personnel to inspect the pond and perform monitoring and maintenance activities. Fencing will be constructed to deter wildlife from entering the pond.

The Class C Storage Facility Collection Pond has been designed to treat sediment for the 1 in 10 year, 24-hour peak discharge and pass the 1 in 200 year, 24-hour peak discharge with a freeboard allowance of 1.0 m. An emergency culvert spillway is located in the northern end of the pond and will discharge to the spillway chute channel via an energy dissipation structure with riprap armouring. The pond is designed to allow sediment to accumulate without impacting required storage capacity. Sediment storage in the pond will be monitored and will be dredged as necessary to ensure that residence times are adequate to meet design criteria for sediment removal.

Water discharges from the pond via gravity to the outlet ditch, to be conveyed downstream to Geona Creek.



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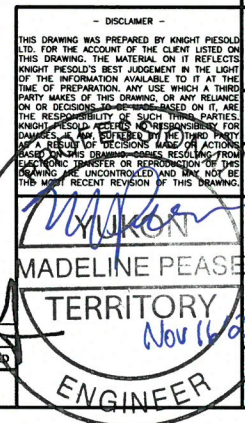
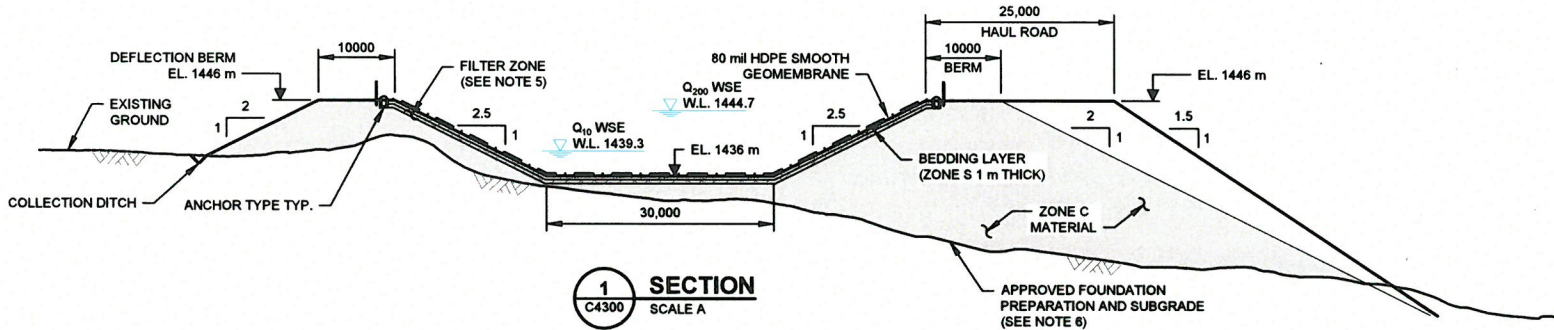


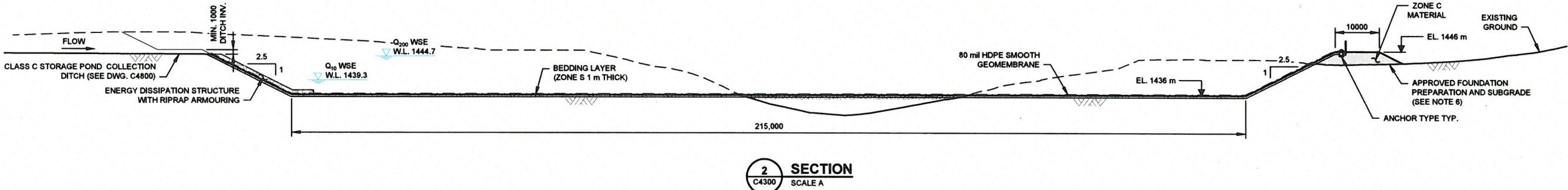


FIGURE 6-18: CLASS C STORAGE FACILITY COLLECTION POND - SECTIONS 1, 2 AND 3



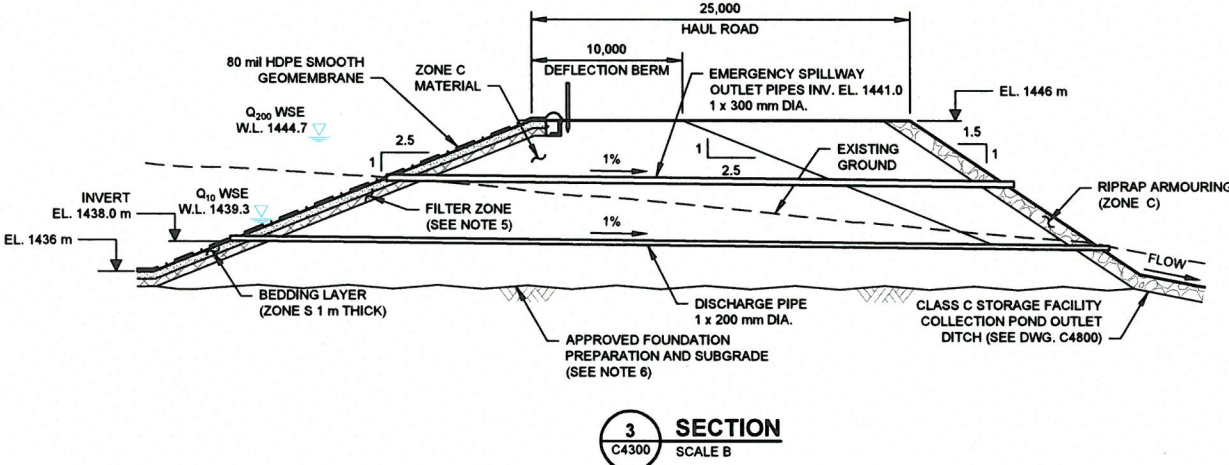
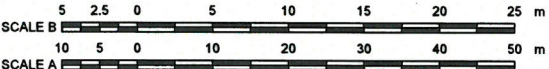
- LEGEND:
- ZONE C
  - ZONE S (BEDDING LAYER)
  - RIPRAP ARMOURING (ZONE C)
  - ZONE F
  - HDPE GEOMEMBRANE

- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
  2. FOUNDATION PREPARATION WITHIN THE EMBANKMENT AND POND FOOTPRINTS TO INCLUDE FOUNDATION DRAINS TO CONVEY GROUNDWATER FLOWS DOWNSTREAM OF THE FACILITIES.
  3. ALL PIPE INLETS SHALL INCLUDE PREFABRICATED HDPE PIPE BOOT SECURED WITH NEOPRENE GASKET AND ANCHORED INTO EMBANKMENT WITH HDPE LINER TAPED JOINT.
  4. DISCHARGE PIPE SHALL INCLUDE LEVEL MONITORING INSTRUMENTATION.
  5. FILTER ZONE AS REQUIRED BASED ON GRADATION OF CLASS C MATERIAL.
  6. EXCAVATION TO COMPETENT FOUNDATION MATERIALS AS DETERMINED BY THE ENGINEER.



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**KUDZ ZE KAYAH PROJECT**

**CLASS C STORAGE FACILITY  
COLLECTION POND  
SECTIONS 1, 2 AND 3**

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|           |                                                   |                        |      |             |          |       |          |          |     |      |             |          |       |          |          |
|-----------|---------------------------------------------------|------------------------|------|-------------|----------|-------|----------|----------|-----|------|-------------|----------|-------|----------|----------|
| C4300     | CLASS C STORAGE FACILITY - COLLECTION POND - PLAN | REV                    | DATE | DESCRIPTION | DESIGNED | DRAWN | REVIEWED | APPROVED | REV | DATE | DESCRIPTION | DESIGNED | DRAWN | REVIEWED | APPROVED |
| 0         | 13NOV/20                                          | ISSUED FOR INFORMATION | AS1  | NSD/SC      |          |       |          |          |     |      |             |          |       |          |          |
| REVISIONS |                                                   |                        |      |             |          |       |          |          |     |      |             |          |       |          |          |
| REVISIONS |                                                   |                        |      |             |          |       |          |          |     |      |             |          |       |          |          |

### **6.3.6 Overburden Stockpile Collection Pond**

The Overburden Stockpile is designed to manage overburden material excavated from the ABM open pit area and beneath site infrastructure. The design of the Overburden Stockpile is detailed in the Waste Rock and Overburden Management Plan (BMC, 2026d).

The area of the Overburden Stockpile Collection Pond will be cleared and grubbed, and any unsuitable foundation material will be removed. The pond embankment will be constructed from Class C waste rock, lined with a 0.5 m layer of filter material, a 0.5 m layer of compacted glacial till material and an 80 mil smooth HDPE geomembrane. The embankment is designed with a crest elevation of 1420.0 masl, a total embankment height of approximately 40 m (as measured from the crest to the downstream toe). An energy dissipation structure on the southern side of the pond will direct runoff from the collection ditches into the pond. The design criteria for the Overburden Stockpile Collection Pond are provided in Table 4-2, design capacities are provided in Table 5-1 and a plan view is shown in Figure 6-19. A section through the Overburden Stockpile Collection Pond is presented in Figure 6-20 that indicates the design pond berm crest elevation, storm storage elevations, and the peak water surface elevation when routing the design flood through the spillway.

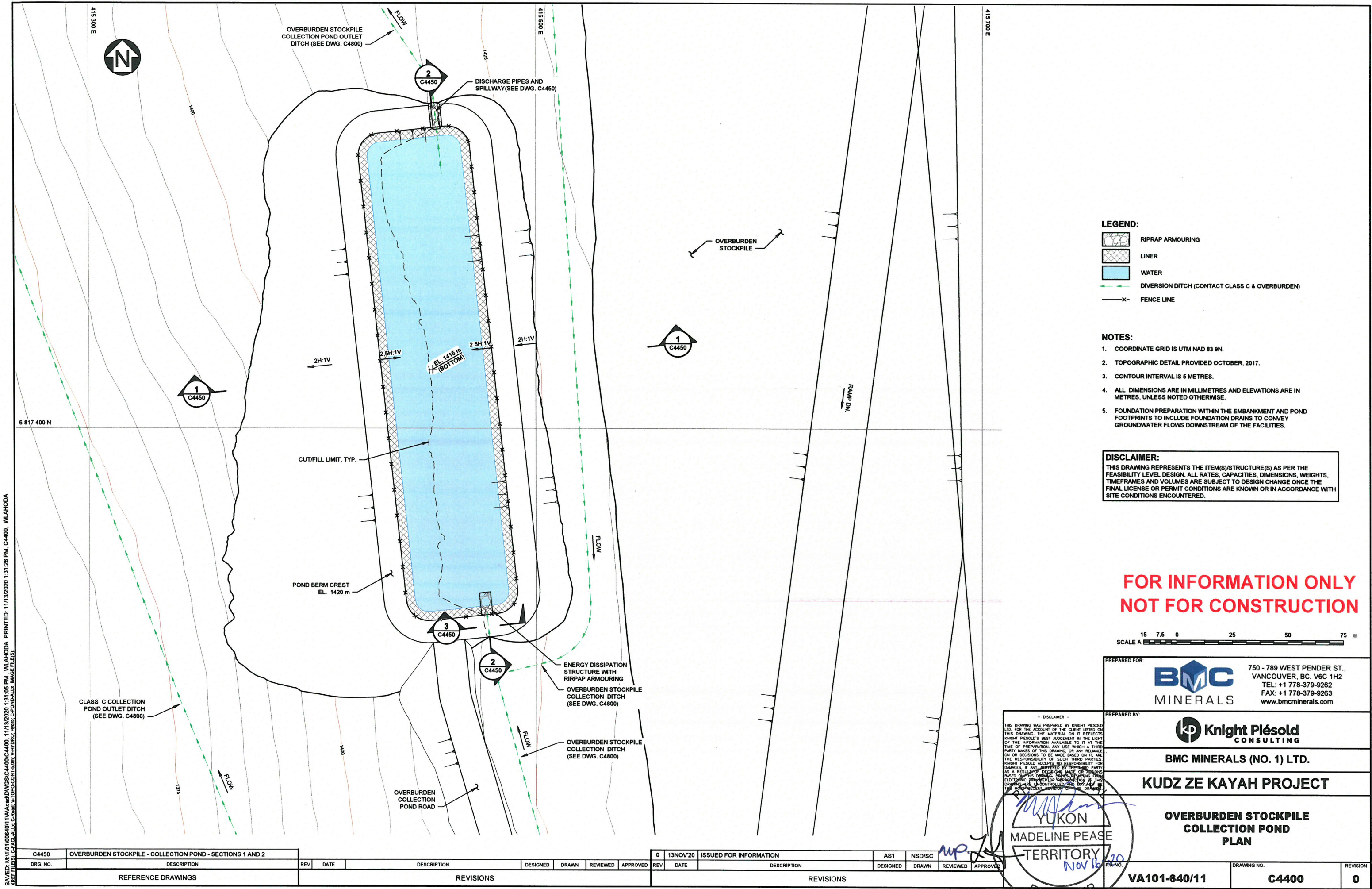
A perimeter service road will be constructed on the crest of the embankment, and a spillway will be constructed in the northern end of the pond. The service road will allow site personnel to inspect the pond and perform monitoring and maintenance activities. Fencing will be constructed to deter wildlife from entering the pond.

The Overburden Stockpile Collection Pond is designed to treat sediment for the 1 in 10 year, 24-hour peak discharge and pass the 1 in 200 year, 24-hour peak discharge with a freeboard allowance of 1.0 m. A 1.0 m wide, 2:1 side slope trapezoidal emergency spillway outlet will direct discharge to the spillway chute channel which is lined with riprap armouring for erosion protection along its length. The pond is designed to allow sediment to accumulate without impacting required storage capacity. Sediment storage in the pond will be monitored and will be dredged as necessary to ensure that residence times are adequate to meet design criteria for sediment removal.

Water discharges from the pond via gravity to the outlet ditch, to be conveyed downstream off site, to Geona Creek.



FIGURE 6-19: OVERBURDEN STOCKPILE COLLECTION POND - PLAN



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XREF FILE(S): C:\ACAD\ALX\Road\_V\TOPO\CONTENTS\HYDRO\Hydro\_C4400\ALX\IMAGE FILE(S)



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5 2.5 0 5 10 15 20 25 m  
SCALE A

|                                                                                       |                            |
|---------------------------------------------------------------------------------------|----------------------------|
|  | RIPRAP ARMOURING           |
|  | ZONE C                     |
|  | ZONE S                     |
|  | ZONE F                     |
|  | OVERBURDEN                 |
|  | HDPE GEOMEMBRANE (PROFILE) |

1. ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
2. SPILLWAY TO HAVE A BASE WIDTH OF 1.0 m MIN.
3. FOUNDATION PREPARATION WITHIN THE EMBANKMENT AND POND FOOTPRINTS TO INCLUDE FOUNDATION DRAINS TO CONVEY GROUNDWATER FLOWS DOWNSTREAM OF THE FACILITIES.
4. ALL PIPE INLETS SHALL INCLUDE PREFABRICATED HDPE PIPE BOOT SECURED WITH NEOPRENE GASKET AND ANCHORED INTO EMBANKMENT WITH HDPE LINER TAPED JOINT.
5. DISCHARGE PIPE SHALL INCLUDE LEVEL MONITORING INSTRUMENTATION.
6. FILTER ZONE AS REQUIRED BASED ON GRADATION OF CLASS C MATERIAL.

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## KUDZ ZE KAYAH PROJECT

### OVERBURDEN STOCKPILE COLLECTION POND SECTIONS 1 AND 2

[illegible]

### **6.3.7 Pit Rim Pond**

The Pit Rim Pond will be constructed from suitable glacial till material and lined with an 80 mil smooth HDPE geomembrane. Water will flow via gravity through three compartments in the pond to settle sediment. After sediment has been settled, flows will be pumped to the water treatment ponds or WTP, depending on water quality.

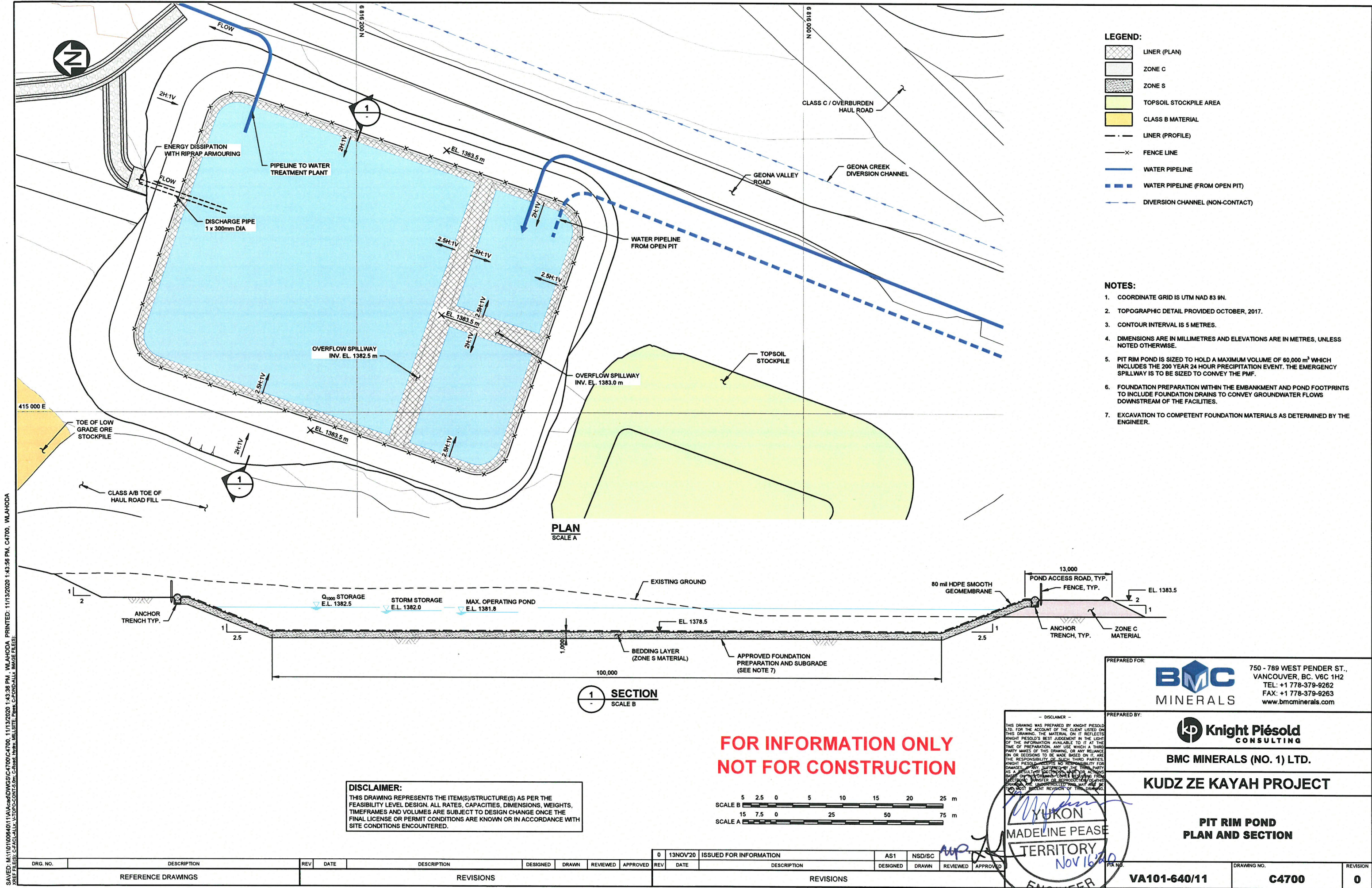
The Pit Rim Pond has been designed with a maximum storage volume of 60,000 m<sup>3</sup>, which includes allowance for predicted Open Pit dewatering flows and storm storage. The embankment is designed with a crest elevation of 1383.5 masl, a total embankment height of approximately 2.5 m (as measured from the crest to the downstream toe). The design criteria for the Pit Rim Pond are provided in Table 4-2, design capacities are provided in Table 5-1 and a plan view is shown in Figure 6-21. Figure 6-21 also shows a section through the Pit Rim Pond that indicates the design pond crest elevation, maximum operating level, and the peak water surface elevation when routing the design flood through the spillway.

A perimeter service road will be constructed on the crest of the pond embankment and will allow site personnel to inspect the pond liner and perform monitoring and maintenance activities. Fencing will be constructed to deter wildlife from entering the pond.

The Pit Rim Pond emergency spillway is designed to pass the 1 in 1,000 year, 24-hour peak discharge with a freeboard allowance of 1.0 m. The culvert spillway discharges to the Class B Storage Facility Collection Pond spillway chute channel via the Pit Rim Pond spillway chute channel, armoured with riprap for energy dissipation at the outlet of the culvert.



FIGURE 6-21: PIT RIM POND - PLAN AND SECTION





### 6.3.8 Diversion Channels

Temporary diversion channels will be used during Construction and Operations to minimize sediment mobilization and erosion and protect natural drainages and watercourses. These diversion channels will be constructed as per engineering design drawings and routinely maintained (e.g., removal of debris or deposited sediments). All diversion channels have been designed to convey the 1 in 50 year, 24-hour storm flow with a minimum of 300 mm of freeboard and to convey the 1 in 200 year, 24-hour storm peak flow without overtopping (i.e., the diversion channels can convey with 1 in 200 year, 24-hour storm with less than 300 mm of freeboard).

The site diversion channels are presented in Figure 6-22 and Figure 6-23, for Construction and Operations, respectively.

The diversion channels are summarized as follows:

- Upgraded Tote Road Diversion Channel: The Tote Road will be upgraded to provide a main Access Road to the Project area. The Diversion Channel will sit along the upgradient side of the Upgraded Tote Road from the Camp to the ABM open pit area will also function as the primary diversion channel in Construction and the early years of Operations. The Upgraded Tote Road Diversion Channel diverts clean water northward along the west side of the Geona Creek drainage area of the Class A and Class B Storage Facilities to downstream of the LWMP;
- Geona Creek Diversion Channel: Directs runoff in the Project area to the LWMP;
- East Diversion Channel: Directs clean water upstream of the Class C Storage Facility and the Overburden Stockpile northward, downstream of the LWMP into Geona Creek;
- South Diversion Channel: Directs clean water upstream of the Class C Storage Facility and the ABM open pit southward, into South Creek;
- Process Plant Diversion Channel: Directs runoff around the Process Plant to the LWMP during early years of Operations and to the UWMP once it is constructed;
- Fault Creek Diversion Channel:
  - Fault Creek is a tributary which flows north into the ABM open pit area. Fault Creek will be diverted during the Construction and Operations phases so that it flows southwards to South Creek, interrupting flow towards the ABM open pit area during Construction and Operations. A portion of Fault Creek may at times be diverted back to its natural watercourse through Geona Creek to minimize unexpected effects on fish and aquatic life, as discussed in the AMP (BMC, 2026f);
  - The design incorporates a diversion ditch constructed alongside the service road;
  - The diversion channel footprint will be stripped and grubbed of all topsoil and excavated to the required depths. The diversion channel will be lined as required to minimize erosion and installed with rock energy dissipaters to reduce water velocity. A plan and typical sections from the Fault Creek Diversion are presented in Figure 6-24; and

- A barrier will be placed at its lower end to prevent fish from using the creek so that it doesn't become temporary fish habitat.
- Upper Access Road Diversion Channel: The Upper Access Diversion Road will be implemented in the later years of the Operations phase to replace the Access Road and associated diversion channel. The Upper Access Diversion Road Channel diverts clean water along the west side of the Geona Creek drainage area upstream of the Class A and B Storage Facilities to downstream of the LWMP and diverts clean water upstream of the ABM open pit south to the Fault Creek Diversion; and
- Class A Storage Facility Diversion Channel: Directs clean water upstream of the Class A Storage Facility, downstream of the LWMP into Geona Creek.

The stormwater model described in Section 5.3 was used to predict the design flows for each channel. Where fine grained soils are exposed, appropriate erosion protection materials will be installed in diversion channels based on the estimated magnitude of flow and flow velocity. All diversion channels discharge through a stabilized outlet designed to handle the expected flow velocities and volumes from the channel without scouring.



FIGURE 6-22: SITE DIVERSION CHANNELS AND COLLECTION DITCHES - PLAN - PROCESS PLANT START-UP

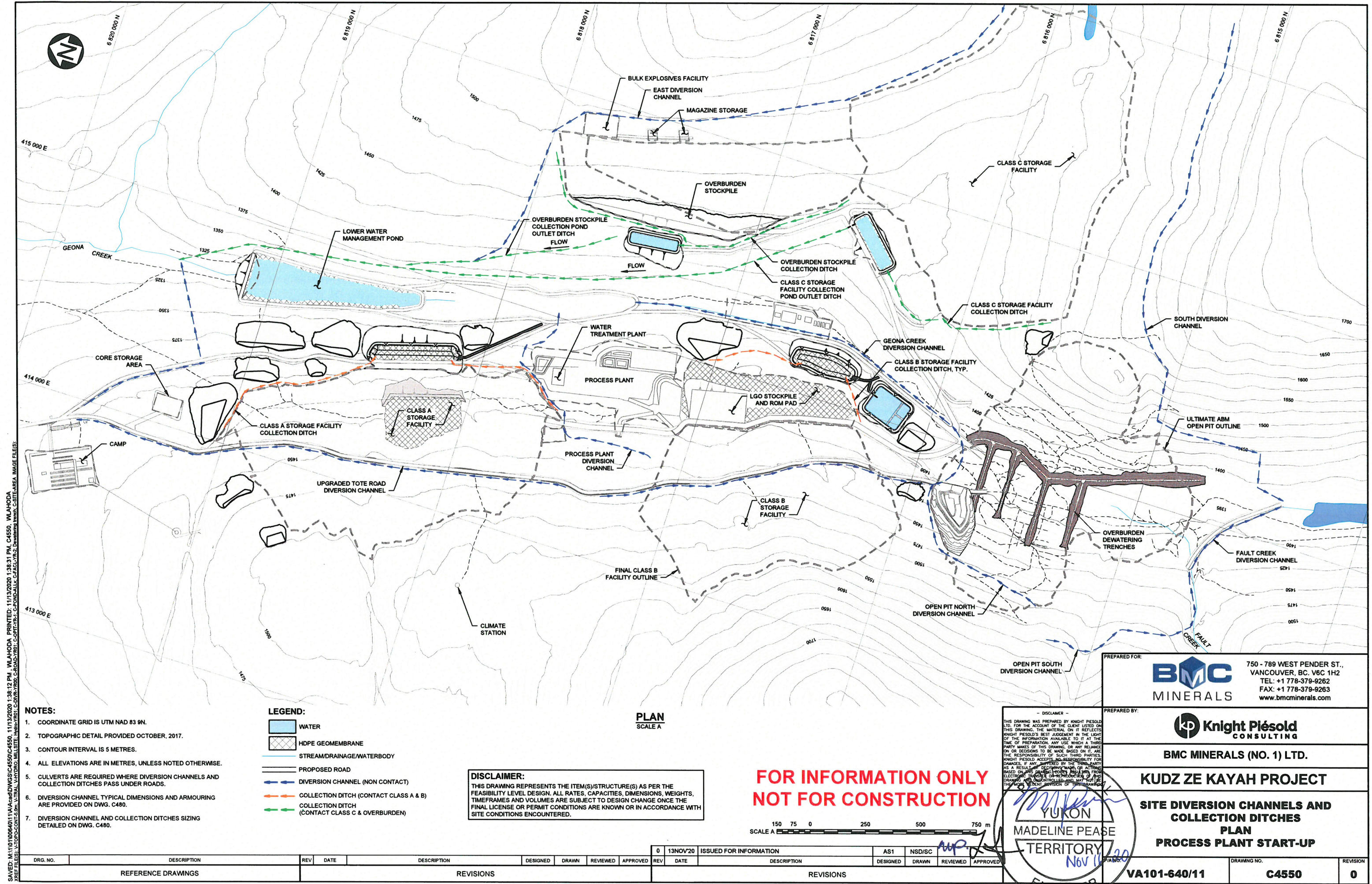




FIGURE 6-23: SITE DIVERSION CHANNELS AND COLLECTION DITCHES - PLAN - END OF MINE OPERATIONS

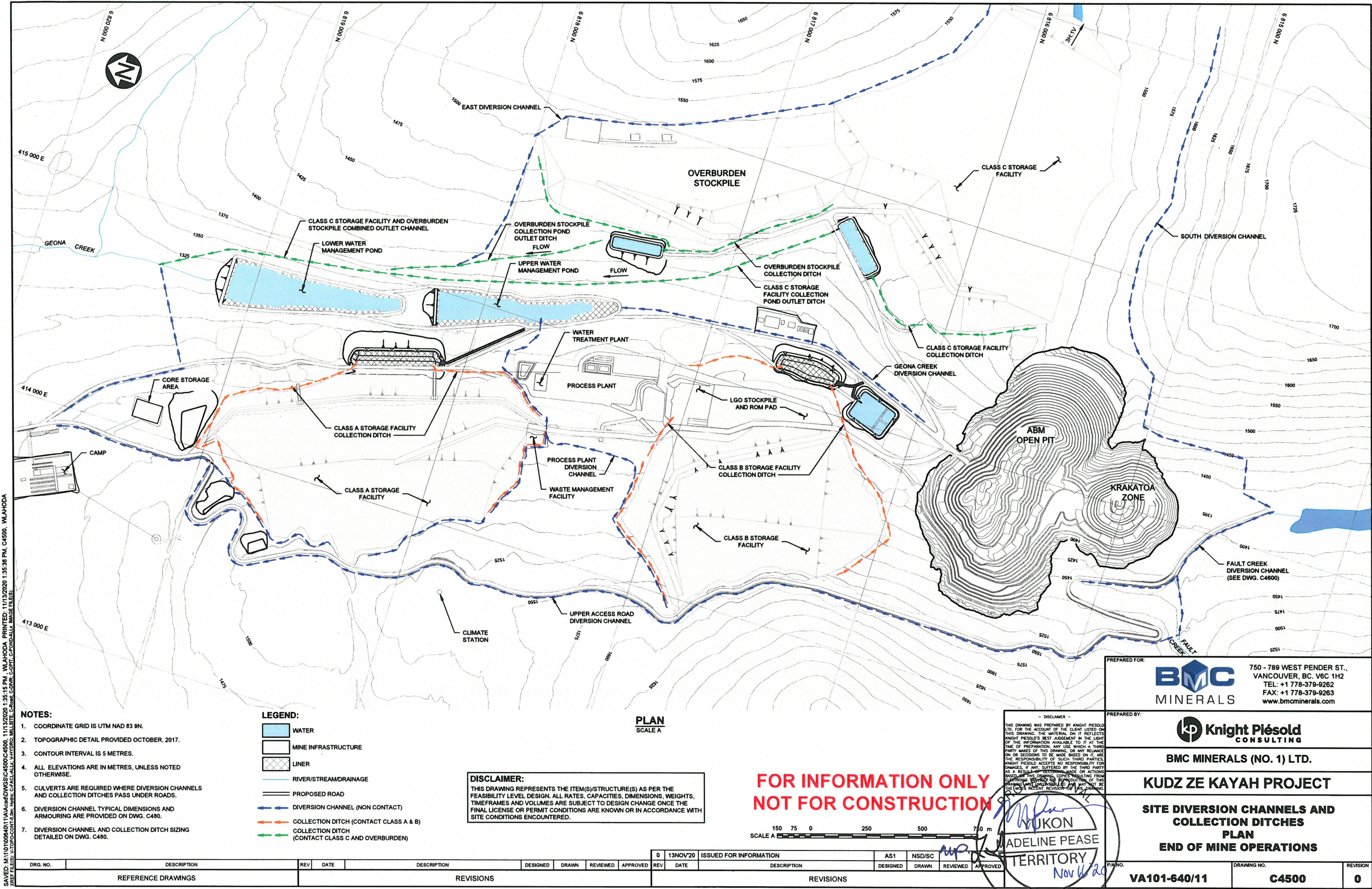
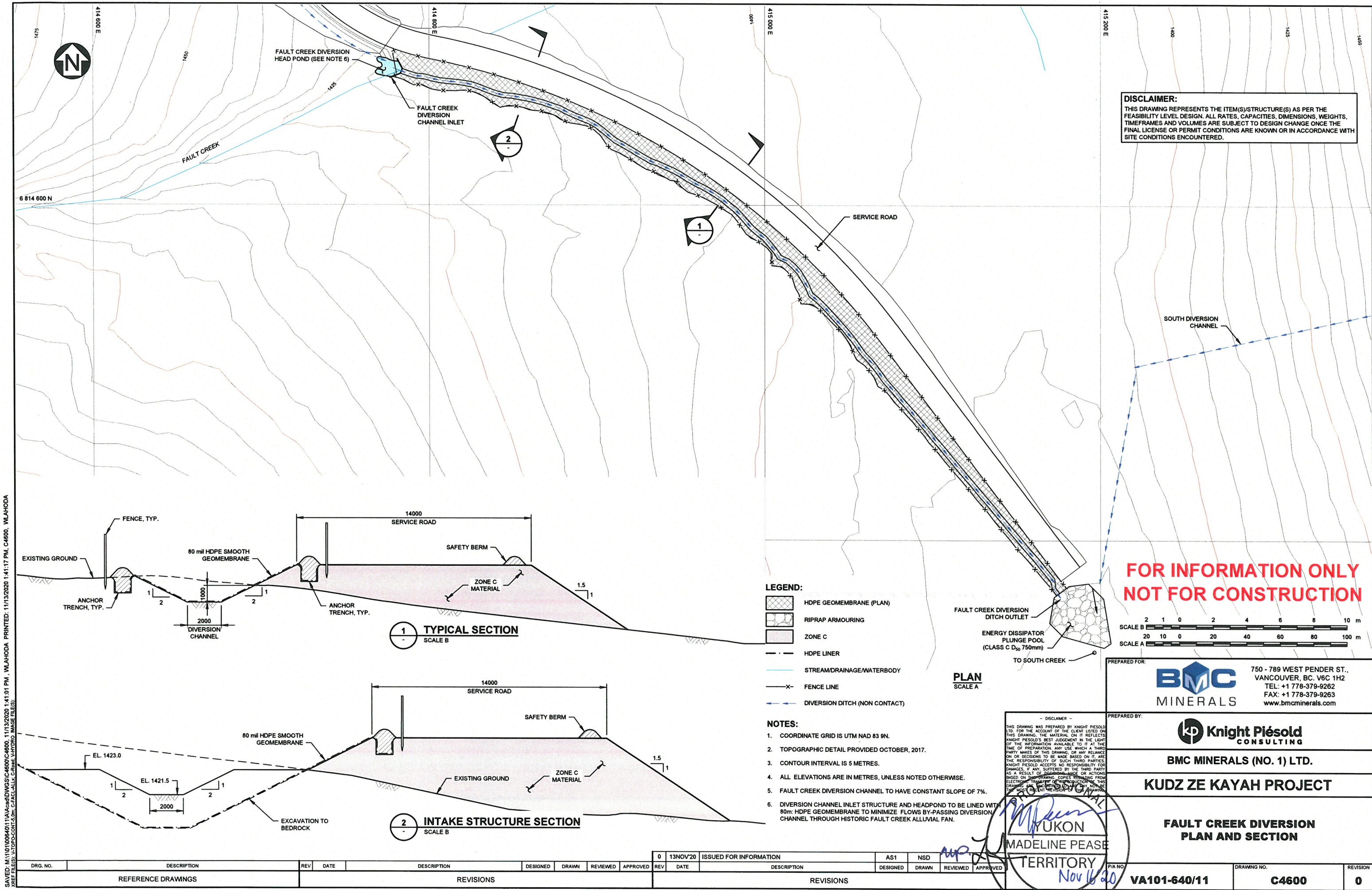




FIGURE 6-24: FAULT CREEK DIVERSION - PLAN AND SECTION





### 6.3.9 Collection Ditches and Culverts

Collection ditches will be constructed to collect runoff from within the Project area. The site collection ditches are presented in Figure 6-22 and Figure 6-23 for the Construction and Operations phases, respectively.

Collection ditch footprints will be stripped and grubbed of all topsoil and excavated to the required depths. Collection ditches will be lined with rip rap, where necessary, to minimize erosion, and installed with rock energy dissipaters to reduce water velocity.

The stormwater model described in Section 5.3 was used to predict the design flows for each ditch and culvert. The location, capacity, diameter, length, and number of culverts required for road construction are summarized in the Road Construction Plan (BMC, 2026b).

### 6.3.10 Water Treatment Plant (WTP)

The WTP has been designed to treat water in two separate feeds, with the following design treatment rates:

- Feed 1: Class A Storage Facility runoff and seepage, and Process Plant recycle – up to 200 m<sup>3</sup>/hr; and
- Feed 2: ROM Pad/LGO Stockpile runoff, and Mine dewatering (via the Pit Rim Pond), and runoff from the Process Plant site – up to 390 m<sup>3</sup>/hr.

Treatment of both Feed 1 and 2 will initially consist of pH adjustment and clarification, as detailed in ISC (2019a). Feed 1 includes a second stage process, for selenium removal. The treated effluent will be discharged to the LWMP for final polishing before discharge to the receiving environment, use for dust control, or being recycled to the Process Plant circuit.

A laboratory treatability study was completed to assess the proposed WTP flowsheet (BQE, 2019b), including testing of the WTP process using expected influent water quality. The laboratory treatability study demonstrated that metals removal objectives can be met using the system as designed. It may be possible to optimize the dosages of consumable reagents to improve the overall process efficiency (which is best performed during commissioning of the full-scale system because reagent dosage rates will depend on the actual water quality reporting to treatment at that time).

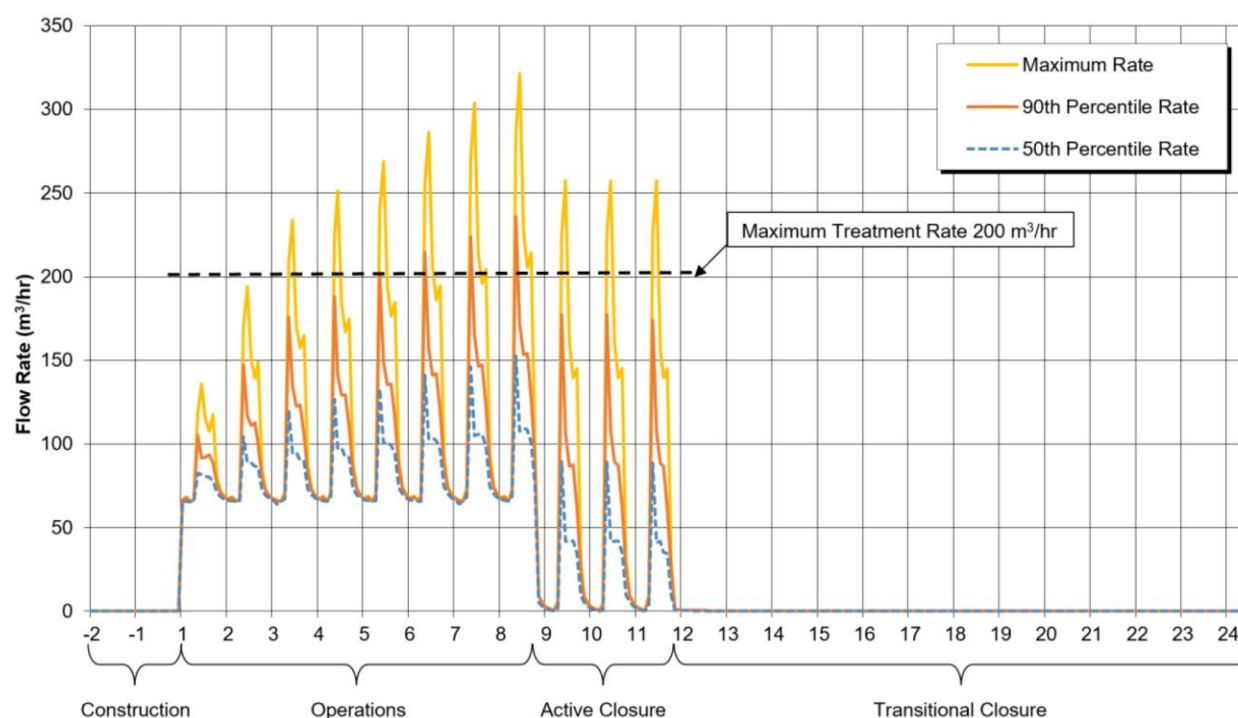
The laboratory treatability study also showed that selenium removal treatment targets were achieved by the system, and that testing of the WTP residue indicated the material is suitable for classification as a non-hazardous waste. This supports the approach of disposing this material in the Class A Storage Facility.

Operation of the WTP is described in detail in the Water Treatment Plant Operations Plan (ISC, 2019b). The WTP will be operational from Process Plant start-up until WQO can be met for all water sources in Closure, including pit lake water that will be treated using alternative processes as needed, as discussed in the Reclamation and Closure Plan (BMC, 2026a).

As presented in the LOM Water Balance Model (KP, 2024a), flows requiring treatment have potential to exceed WTP capacity for short periods during freshet (May/June) and the months that immediately follow. The possibility exists for treatment requirements to exceed the WTP design capacity starting in Year 3 of Operations for Feed 1 and Feed 2.

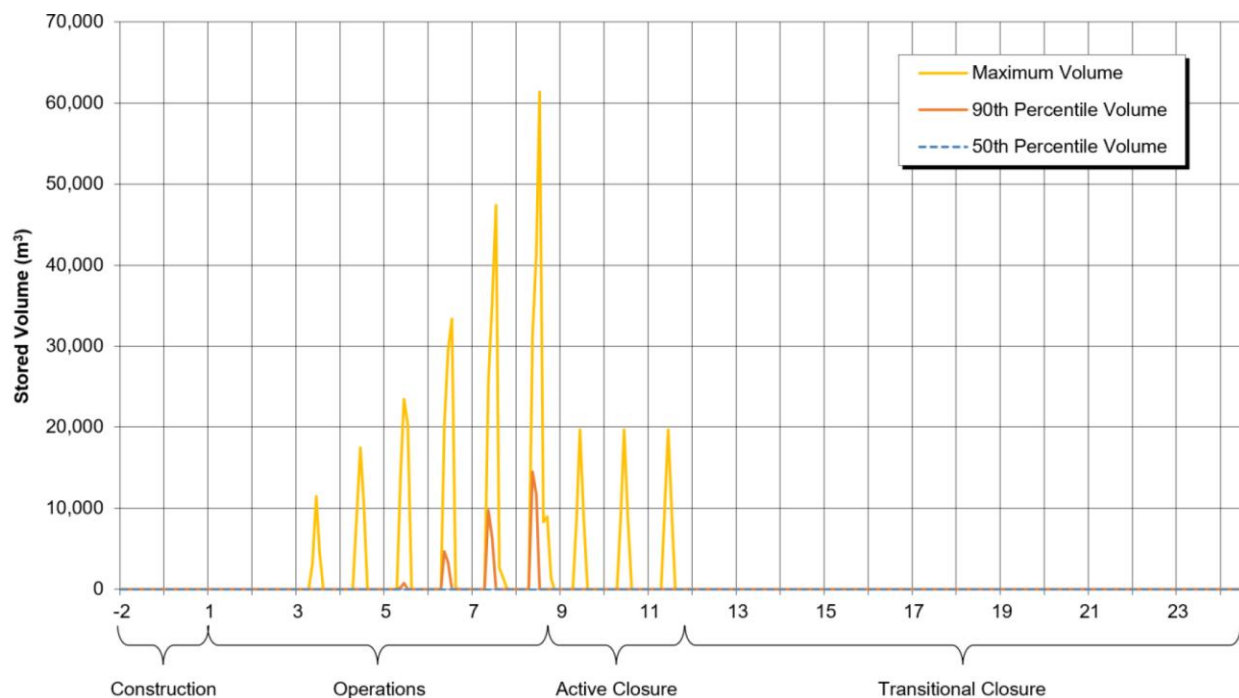
The predicted influent rate for the first treatment circuit (Feed 1: Class A Storage Facility Collection Pond and Process water) using the VCC Model is presented in Figure 6-25. Treatment demand for Feed 1 increases over the life of the Project as the Class A facility grows. The 50<sup>th</sup> percentile, 90<sup>th</sup> percentile and maximum modelled volumes of water in excess of the Feed 1 treatment capacity are presented in Figure 6-26.

The model results indicate there is an approximately 10% probability of up to 14,000 m<sup>3</sup> of Feed 1 water exceeding WTP treatment capacity during Operations, and an approximately 2% probability of up to 62,000 m<sup>3</sup> of excess. The AMP (BMC, 2026f) presents multiple potential management approaches to ensure that an exceedance of WTP capacity does not result in EQS or WQO being exceeded.



**Figure 6-25: WTP Feed 1 Flow Rate by Year**

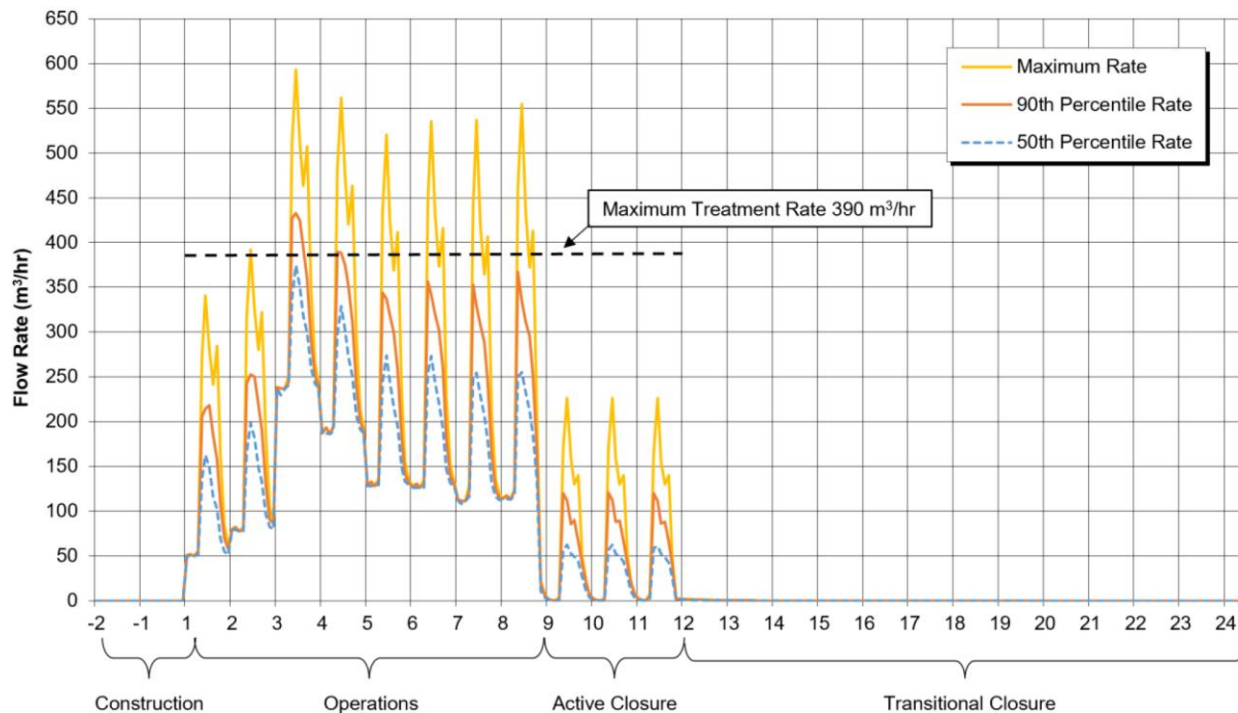




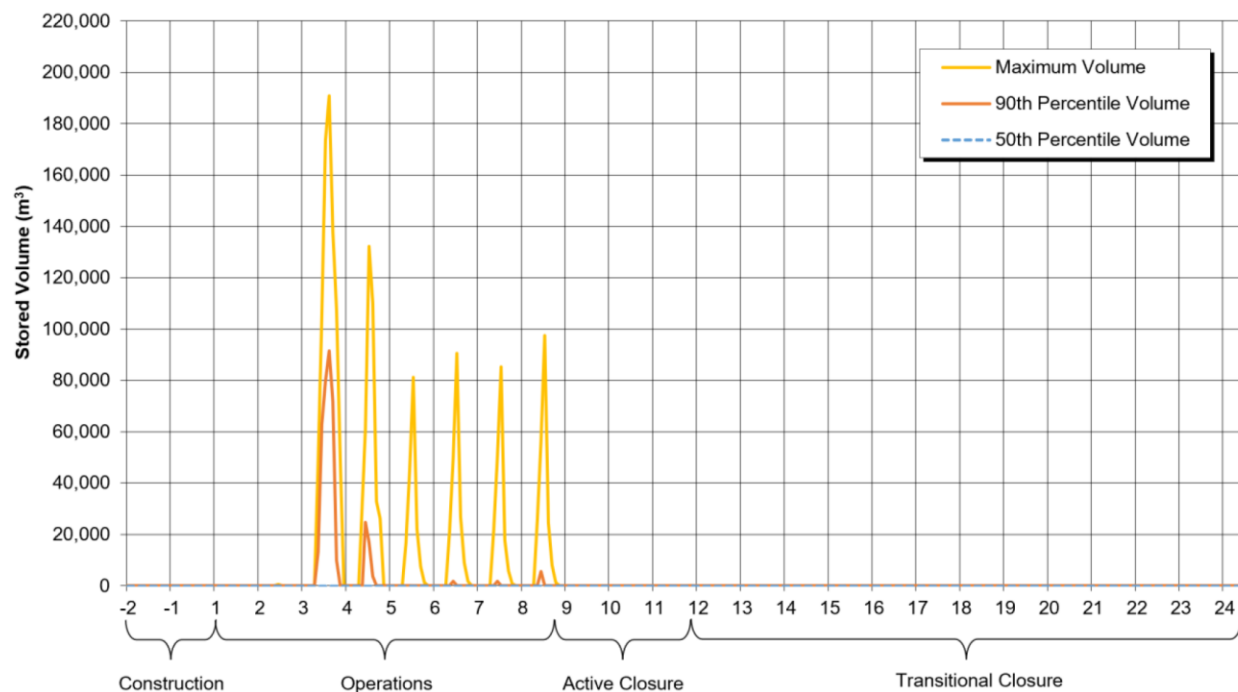
**Figure 6-26: WTP Feed 1 Excess Water by Year**

The predicted influent rate for the second treatment circuit (Feed 2: ROM Pad/LGO Stockpile runoff, Pit Rim Pond flows, and Process Plant site runoff) using the VCC Model is presented in Figure 6-27. The 50<sup>th</sup> percentile, 90<sup>th</sup> percentile and maximum modelled volumes of water in excess of the Feed 2 treatment capacity are presented in Figure 6-28.

The model results indicate there is an approximately 10% probability of up to 92,000 m<sup>3</sup> of Feed 2 water exceeding WTP treatment capacity during Operations, and an approximately 2% probability of up to 192,000 m<sup>3</sup> of excess. The AMP (BMC, 2026f) presents multiple potential management approaches to ensure that an exceedance of WTP capacity does not result in EQS or WQO being exceeded.



**Figure 6-27: WTP Feed 2 Flow Rate by Year**



**Figure 6-28: WTP Feed 2 Excess Water by Year**



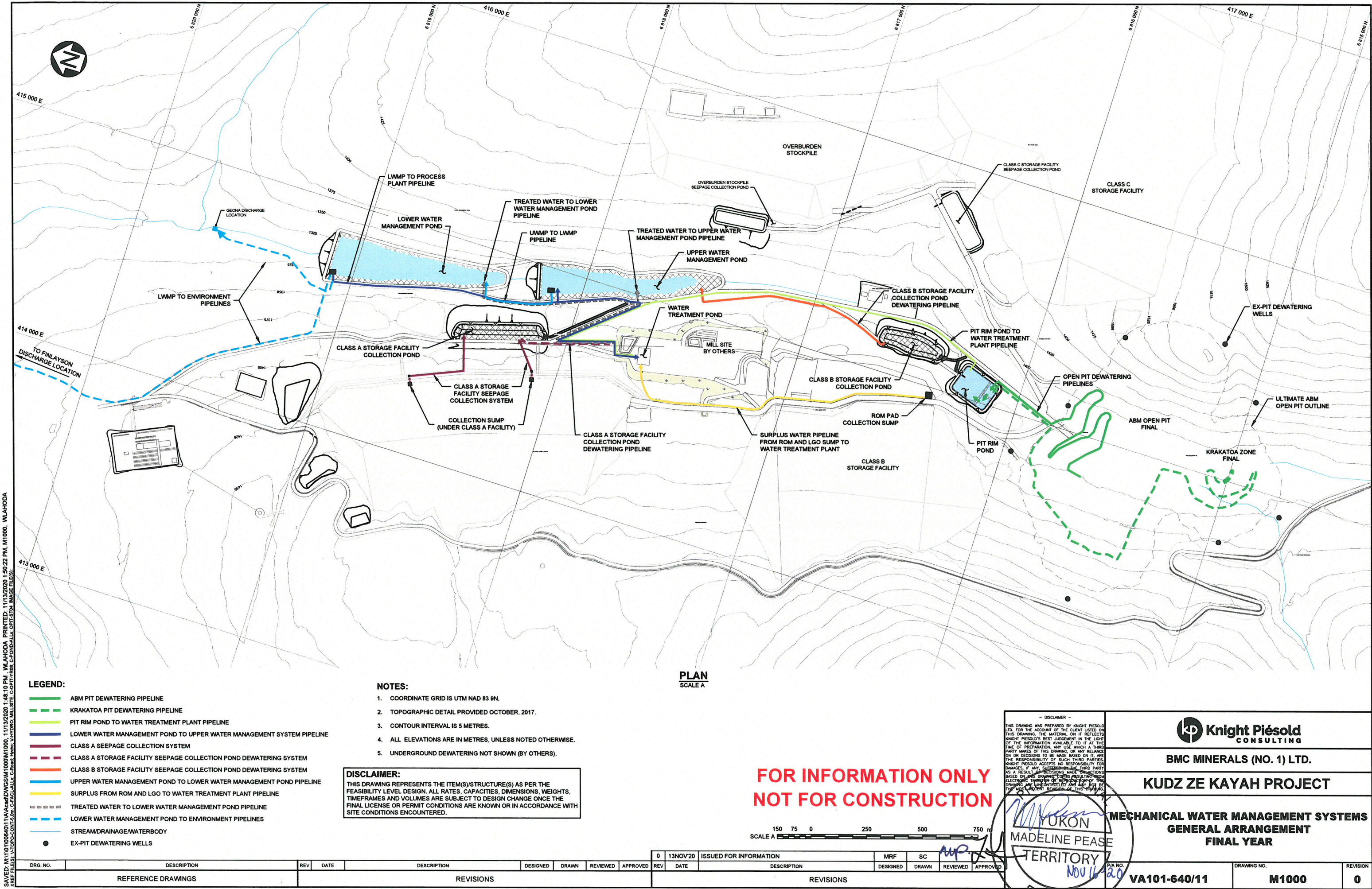
### **6.3.11 Mechanical Water Delivery Systems**

Water management infrastructure includes mechanical water pumping and piping systems, consisting of the ABM open pit dewatering systems, freshwater supply and discharge, and the collection pond dewatering systems (as described in Sections 6.2.1 to 6.2.7). These systems are presented in Figure 6-29, and include the following:

- Mine dewatering systems:
  - Construction overburden dewatering trench system;
  - Operations Mine dewatering systems; and
  - Operations external to the pit dewatering wells.
- Freshwater reclaim and discharge systems:
  - Reclaim water supply system from LWMP to the Process Plant and UWMP;
  - Discharge from UWMP to LWMP;
  - Discharge from LWMP to Geona Creek; and
  - Discharge from LWMP to Finlayson Creek.
- Water management pond dewatering systems:
  - Pit Rim Pond to WTP or Geona Creek during Construction phase;
  - ROM Pad Sump to WTP;
  - Class A Storage Facility seepage collection pumping system;
  - Class A Storage Facility Collection Pond to WTP; and
  - Class B Storage Facility Collection Pond to UWMP.



FIGURE 6-29: MECHANICAL WATER MANAGEMENT SYSTEMS - GENERAL ARRANGEMENT - FINAL YEAR





## 6.4 SEDIMENT AND EROSION CONTROL

Sediment and erosion control measures will be necessary to limit effects on the surrounding environment and water sources due to earth-moving activities related to the Construction and Operations phases of the Project. Common construction activities that have the potential to expose soils to erosive forces include, but are not limited to:

- Clearing vegetation and soil;
- Ice rich soil and overburden;
- Excavations;
- Blasting;
- Road and trail construction;
- Watercourse diversions or crossings;
- Stockpiling material; and
- Runoff from active work areas.

The Project will implement a proactive approach to sediment and erosion control by:

- Limiting the area of exposed soils by minimizing vegetation clearing to the areas necessary;
- Installing erosion and sediment control mitigations before construction begins;
- Directing runoff and surface water around active construction and operation areas;
- Reducing flow velocities in ditches and diversion channels; and
- Progressively revegetating disturbed areas to improve soil stability and reduce erodible surfaces.

A detailed sediment and erosion plan, including a description of additional erosion and sediment control mitigation measures to address construction, temporary activities, and emergency situations, can be found in the Sediment and Erosion Control Plan (BMC, 2026h).

## 6.5 SANITARY WASTEWATER MANAGEMENT

Sanitary wastewater management is presented in this Water Management Plan for completeness however, the sanitary wastewater component of water management has been submitted for authorization under the Type B (Municipal Undertaking) Water Licence with the Yukon Water Board.

Sewage from the accommodation complex will be collected by buried sewers covered for insulation. The raw sewage will be gravity fed to a package sewage treatment plant designed for the 375 person camp. The raw sewage will be processed to meet Type 3 effluent requirements ( $\leq 10$  mg/L Biochemical Oxygen Demand,  $\leq 10$  mg/L Total Suspended Solids). The treated effluent will then be discharged to ground via on site in ground disposal fields. The sewage treatment plant will produce

a bio-sludge which will require periodic removal. This sludge will require sanitary burial on site in the Class A Facility, or will be transported by truck off site.

Sewage from the Process Operations Centre will be collected by buried sewers covered for insulation. The raw sewage will be gravity fed to a package sewage treatment plant designed for the operational manning day. The raw sewage will be processed to meet “Type 3” (BC, 2004) effluent requirements (45 mg/L Biochemical Oxygen Demand, 45 mg/L Total Suspended Solids). The treated effluent will then be discharged to ground via an on site in ground disposal field. The sewage treatment plant will produce a bio-sludge which will require periodic removal. This sludge will require sanitary burial on site in an approved location, or will be transported by truck off site. Sewage from the Mining Workshop will be collected in holding tanks and transferred to either of the sewage treatment plants.

The operation of the sewage treatment plant will be part of a regular monitoring and maintenance program so that deficiencies in operation, pipeline rupture, pump/power breakdown and the like, will be reported to relevant Manager for rectification. In the event of power failure, the standby generator will be put into operation. Similarly, in the case of a pump failure, the backup pump will be put on-line. If there is any danger of wastewater becoming mixed with a body of freshwater in the event of a raw sewage pipe rupture, a containment structure will be constructed immediately. Alternatively, the leaked wastewater may be stored temporarily in an empty tank and then pumped into the sewage plant for treatment. Any spills inside the treatment plant will be contained therein and pumped back into the system.

## **6.6 CONSTRUCTION WATER USE**

Construction water uses for the Project includes potable water for the Camp and other Project infrastructure, dust suppression for service and haul roads, wash water at the truck shop, and construction use such as concrete production. Estimated water usage varies with season and with construction activity throughout the construction period and has been included in the LOM Water Balance Model (KP, 2024a).

## **6.7 FROZEN MATERIAL MANAGEMENT**

Earthworks construction and some operational activities of the Project will result in excavation and exposure of frozen overburden soils, identified as either permafrost or from in the near-surface active layer that freezes seasonally. Permafrost in the Project area is detailed in the Site Characterization Plan (BMC, 2026e). All unsuitable foundation materials, including permafrost and near surface active layers, will be removed at the discretion of the supervising engineer and stored in the Overburden Stockpile. More detailed discussion of frozen material management is provided in the Mine Development and Operations Plan (BMC, 2026l).



## 7. PROJECT WATER USE

### 7.1 WATER USE SOURCES

Direct water use sources for the Project include mine and infrastructure dewatering at an estimated rate of up to 8,220 m<sup>3</sup> per day based on a monthly average. Groundwater wells will supply additional potable water to the Administration and Accommodation Complexes, and this water use has been submitted for authorization under a Type B Water Licence (MN22-048) with the Yukon Water Board.

Other Project activities related to Schedule 7 of the *Waters Regulation* include:

- Watercourse crossings, discussed in the Road Construction Plan (BMC, 2026b);
- Watercourse training and erosion control;
- Diversion and management of surface water for the purpose of flood control;
- Diversion of Fault Creek; and
- Storage of water in dammed ponds.

### 7.2 SITE WATER MANAGEMENT

Water use requirements for the Project (excluding potable water) include Process Plant commissioning and make-up water, gland seal water, maintenance water, fire suppression and dust control water. Sources of water for the Project include mine and infrastructure dewatering as detailed in Section 7.1. A summary of the estimated Project water utilization is detailed in Section 7.3 through Section 7.6 and summarized in Table 7-1.

**Table 7-1: Summary of Estimated Daily Site Water Utilization During Operations**

| Usage             | Location                                         | Approximate Quantity (m <sup>3</sup> /day) | Rationale                                                                                                             | Water Supply |
|-------------------|--------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|--------------|
| Process Water     | Initial Commissioning                            | n/a                                        | Once off filling of plant vessels                                                                                     | LWMP         |
|                   | Make Up Water, No Paste Plant                    | 450                                        | 18.4 m <sup>3</sup> /hour estimated make up water                                                                     | LWMP/WTP     |
|                   | Make Up Water, With Paste Fill Plant Operational | 950                                        | 39.4 m <sup>3</sup> /hour - estimated increase of 21 m <sup>3</sup> /hr make up water when paste plant is operational | LWMP/WTP     |
| Maintenance Water | Mine Workshop, Equipment Wash Bay                | 150                                        | 5 L/s x 8 hour/day                                                                                                    | LWMP         |
| Fire Water        | Various                                          | n/a <sup>1</sup>                           | n/a                                                                                                                   | LWMP         |
| Dust Control      | Mobile                                           | 1,200                                      | 50 m <sup>3</sup> /hr (24 hrs) during summer months                                                                   | LWMP         |
|                   | <b>Total <sup>2</sup></b>                        | <b>2,300</b>                               |                                                                                                                       |              |

<sup>1</sup>Fire water quantity not identified and will be used on emergency basis

<sup>2</sup> Total quantity assumes paste plant is operational and dust control water is being used. Actual usage will be less at other times.

### **7.3 MINE DEWATERING**

Dewatering of the ABM open pit and underground workings occurs throughout Construction and Operations, with water pumped to the Pit Rim Pond. Dewatering rates for each year of mining activity were estimated by Tetra Tech EBA (2019) and included surface runoff and precipitation (KP, 2024a). The peak average water usage rate is predicted in May of Year 3 of Operations and is estimated at 254,762 m<sup>3</sup> for the month, or 8,220 m<sup>3</sup>/day.

### **7.4 POTABLE WATER**

Potable water for the Accommodation Complex will be sourced from the existing exploration camp supply well and/or new well(s), if required.

Potable water for the Administration Complex will be produced at the Process Plant with a potable water treatment plant, and/or sourced from new well(s), if required. These sources will deliver water to the administration offices, mine dry, washrooms, and other areas of the Operation as required. Raw water for production of potable water will be drawn from the Process Plant raw water tank, with make-up water drawn from the LWMP as needed.

The use of groundwater wells for potable water has been submitted for authorization under a Type B Water Licence (MN22-048) with the Yukon Water Board.

### **7.5 PROCESS WATER**

Process water, including initial commissioning and process make-up water will be supplied from the LWMP and/or from the WTP. This water will be recirculated through the Process Plant requiring minimal ongoing make-up water to supplement the process during normal operations. The Process Plant has a negative water balance with consistent water losses resulting from the production of concentrates and tailings. Estimated make-up water during normal operations is approximately 18.4 m<sup>3</sup>/hr. An additional estimated 21.0 m<sup>3</sup>/hr of make up water will be required when paste backfill is being produced. Estimated average water demand for the Process Plant is approximately 450 m<sup>3</sup>/day, increasing to 950 m<sup>3</sup>/day when paste backfill is being produced. Process Plant make-up water will be pumped into an approximately 800 m<sup>3</sup> storage tank located beside the Process Plant.

### **7.6 MAINTENANCE WATER**

Fresh water will be required for maintenance of equipment including in the Mine Workshop and equipment wash bays. The Mine Workshop and wash bays are estimated to use 150 m<sup>3</sup>/day of water from the LWMP. Where practicable, wash water will be recycled to reduce new water requirements from the LWMP.

### **7.7 FIRE SUPPRESSION**

Fire water distribution systems will be installed around the Process Plant and Camp areas with hydrants at strategic locations. Firewater storage is planned to be 1,000 m<sup>3</sup> (400 m<sup>3</sup>/hr for 2.5 hours) at the Process Plant and 250 m<sup>3</sup> (125 m<sup>3</sup>/hr for 2 hours) at the Camp.



A water truck will also provide emergency water supply in the event of scrub fires.

## **7.8 DUST CONTROL**

During Construction and Operations, the water required for dust suppression will be pumped into water trucks from the LWMP and other locations as required. Water may be sourced from a groundwater supply well if water quality from other sources is unsuitable. Water quality will be monitored regularly to ensure that it suitable. Dust suppression demand is estimated to be 50 m<sup>3</sup>/hr for 24 hours per day during the summer season from May through September. Demand for water for dust control will be variable throughout the year, with the use of water not practical in the winter months.

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## **APPENDIX A: TABLE OF CONCORDANCE**

| Reference No. | Proponent Commitment / Mitigation                                                                                                                                                                                                                                                                                                                                                                                                      | Where addressed                                                                                                                                                                             |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| YESAB R39     | As part of the design work required for permitting, future site investigations will be undertaken to refine the hydrogeological model and rock characteristics.                                                                                                                                                                                                                                                                        | See Section 5.4 of the Water Management Plan                                                                                                                                                |
| YESAB R87     | BMC will undertake revisions to water modelling which will be based on additional monthly baseline water quality and quantity data, at future stages of Project permitting. However, we will undertake any revisions to the work plan for any potential re-modelling in consultation with the Yukon Water Board Secretariat (and their technical consultants).                                                                         | See Chapter 5 of the Water Management Plan<br><br>Water models were reviewed by YWB and deemed adequate for public comment. Subsequent updates were performed in response to Interventions. |
| YESAB R91     | Sensitivity analyses (which may include precipitation variability, pit groundwater inflow rates, potential implications related to climate change, etc.), will be modelled as part of the detailed design phase and on-going water balance model development.                                                                                                                                                                          | See Section 5.1 of the Water Management Plan                                                                                                                                                |
| YESAB R92     | All management plans will be updated as Project planning progresses if preceding work is materially updated.                                                                                                                                                                                                                                                                                                                           | The Water Management Plan incorporates all updated modelling conducted for the Project as it relates to water management                                                                    |
| YESAB R98     | Details of the diversion structures will be developed during the detailed design phase.                                                                                                                                                                                                                                                                                                                                                | See Section 6.3.8 and 6.3.9 of the Water Management Plan.                                                                                                                                   |
| YESAB R99     | Details of the water management structure designs will be refined during the detailed design phase in preparation for licensing.                                                                                                                                                                                                                                                                                                       | See Section 6.3 of the Water Management Plan                                                                                                                                                |
| YESAB R103    | Detailed sediment pond designs will be included as part of the detailed design phase prior to application of the Water Licence.                                                                                                                                                                                                                                                                                                        | See Section 6.3.5 and 6.3.6 of the Water Management Plan                                                                                                                                    |
| YESAB R111    | The next iteration of the water quality model will incorporate the KZ-37 water quality results along with other data collected since the 2017 report was issued.                                                                                                                                                                                                                                                                       | See Section 5.2 of the Water Management Plan                                                                                                                                                |
| YESAB R113    | BMC will update modelling with additional data as required during the water licensing stage.                                                                                                                                                                                                                                                                                                                                           | See Chapter 5 of the Water Management Plan                                                                                                                                                  |
| YESAB R117    | It is expected that the preliminary Water Quality Objectives (pWQOs) and related water quality assessments will be refined as additional baseline water quality data are collected.                                                                                                                                                                                                                                                    | See Section 4.3.2 of the Water Management Plan                                                                                                                                              |
| YESAB R134    | Any revisions to our work plan for any potential re-modelling the groundwater quality and quantity will be in consultation with the Yukon Water Board Secretariat (and their technical consultants). We recognize that it is important that our methodology for doing so is supported by the licensing agency.                                                                                                                         | See Chapter 5 of the Water Management Plan<br><br>Water models were reviewed by YWB and deemed adequate for public comment. Subsequent updates were performed in response to Interventions. |
| YESAB R156    | Effluent quality standards (EQS) will be established for the Lower Water Management Pond discharge (KZ-8) and will be the primary control for ensuring WQOs are met all the time. These EQS will be established during the water licencing process using updated versions of the water quality model and Water Quality Objectives.                                                                                                     | See Section 4.3.1 of the Water Management Plan                                                                                                                                              |
| YESAB R163    | Geotechnical design considerations related to permafrost degradation in the area of the Water Management Ponds will be included in the detailed design study. Final design of these facilities will be completed prior to submission of permit applications to the regulatory authorities and will include mitigation for any identified hazards.                                                                                      | See Section 6.3 of the Water Management Plan                                                                                                                                                |
| YESAB R274    | Under current conditions, the preliminary assessment of a potential failure of the WMPs indicated that impacts to Geona Creek fisheries would be limited to areas downstream of the Robert Campbell Highway to the confluence with Finlayson River. As these potential impacts appear minimal, BMC will incorporate mitigative measures into the final WMP detailed design to restrict potential impacts to areas upstream of the RCH. | See Section 4.2 and Section 6.3 of the Water Management Plan                                                                                                                                |



| Reference No.            | Proponent Commitment / Mitigation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Where addressed                                                                                                                                                                                                                        |
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| YESAB R2-30              | Pilot scale testing of the Water Treatment Plan process using expected water inputs from the Kudz Ze Kayah Project will take place after the appropriate design work is completed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | See Section 6.3.10 of the Water Management Plan                                                                                                                                                                                        |
| YESAB R2-58              | As part of the detailed design phase of the Project BMC will initiate a pilot scale plant to test the efficiencies of the proposed design and has proposed mitigation measures in the event that the design does not meet the stated efficiencies                                                                                                                                                                                                                                                                                                                                                                                                                | See Section 6.3.10 of the water Management Plan                                                                                                                                                                                        |
| YESAB R2-78              | Pre-strip all overburden with permafrost (to bedrock or competent, ice-free material) within the pond and dam footprints, and extend stripping along the pond perimeter/berm, including the immediate upslope area. Ensure the dam foundation is keyed into competent, ice-free material. Monitor and manage (as required) the stripped areas above the pond perimeter/berm for deposition of localized mass movements. Where required, implement spur road construction techniques specifically designed for ice-rich permafrost.                                                                                                                               | See Section 6.3 of the Water Management Plan                                                                                                                                                                                           |
| YESAB R3-4               | As part of this engineering, in order to mitigate any residual risk, BMC is planning to excavate any "at risk" overburden underlying key structures prior to construction, this includes (but is not limited to): the Class A Buttress, the Lower Water Management Pond embankment, and the Upper Water Management Pond embankment and the Process Plant. Any potential for weak foundation conditions will also be mitigated by buttressing embankments with excess construction material available on site, thereby increasing the factor of safety of the embankment.                                                                                         | See Section 6.3 of the Water Management Plan                                                                                                                                                                                           |
| YESAB R3-15              | The diversion of Fault Creek during construction and at closure will be scheduled to minimize fluctuations during nesting periods as much as practicable (ideally during the late fall or through the winter).                                                                                                                                                                                                                                                                                                                                                                                                                                                   | See Section 6.2.1 of the Water Management Plan                                                                                                                                                                                         |
| YESAB R4-8               | BMC is committed to working with RRDC to include their mitigation measures in the planning and ongoing operation of the Project once they are received. Likewise, BMC is committed to working with LFN in incorporating any specific LFN Kaska Elder TK that they might provide into the Project planning and operation once they are received.                                                                                                                                                                                                                                                                                                                  | Dena Cho reviewed and contributed to all draft management plans. Once BMC had amended the plans to address Dena Cho's comments, BMC sent them to RRDC Chief and Council for review prior to BMC finalizing and submitting them to EMR. |
| YESAB R4-8               | Fault Creek has been identified by RRDC Elders as a drinking water source. Given the importance of this creek, BMC has designed the Project to ensure that the water quality of the creek is not impacted by the proposed mine infrastructure (i.e. no mine infrastructure is proposed in the vicinity of Fault Creek). The creek will continue to be monitored through the Project phases to ensure that this avoidance mitigation measure is successful (i.e. that there are no detectable changes in the water quality from baseline).                                                                                                                        | See Section 6.3.8 of the Water Management Plan                                                                                                                                                                                         |
| RRDC Adequacy Review R-1 | BMC has offered a collaborative and cooperative approach to environmental planning by proposing a joint BMC-Kaska environmental program, as outlined in BMC's letter to RRDC May 5th, 2017, Proposal for BMC-Kaska Environmental, Cultural and Heritage Management at the Kudz Ze Kayah Project, Yukon, Canada. The Conceptual Management Plans, presented in the Project Proposal, will be used as the basis for developing detailed plans during the permitting stage (i.e. to support the Water Licence and Quartz Mining Licence Applications). BMC intends to work with RRDC's wholly owned Dena Cho Environmental group in the development of these plans. | Dena Cho reviewed and contributed to all draft management plans. Once BMC had amended the plans to address Dena Cho's comments, BMC sent them to RRDC Chief and Council for review prior to BMC finalizing and submitting them to EMR. |
| RRDC Adequacy Review R-1 | The monitoring and management plans will not be submitted by BMC to the Water Board or Energy Mines and Resources until they have been jointly reviewed by BMC and RRDC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Dena Cho reviewed and contributed to all draft management plans. Once BMC had amended the plans to address Dena Cho's comments, BMC sent them to RRDC Chief and Council for review prior to BMC finalizing and submitting them to EMR. |

| Reference No.                              | Proponent Commitment / Mitigation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Where addressed                                                                                                                                                                                                                                                                                                   |
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| RRDC Adequacy Review R-8                   | The next iteration of the water quality model (that will be submitted as part of the Type A Water Licence Application) will incorporate the KZ-37 water quality results along with other data collected since the report was issued.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | See Section 5.2 of the Water Management Plan                                                                                                                                                                                                                                                                      |
| RRDC Adequacy Review R-12                  | Additional sensitivity analyses (which may include precipitation variability, pit groundwater inflow rates, potential implications related to climate change, etc.) will be modelled as part of the detailed design phase and on-going water balance model development. This additional modelling will be included in the Type A Water Licence Application.                                                                                                                                                                                                                                                                                                                                                         | See Section 5.1 of the Water Management Plan                                                                                                                                                                                                                                                                      |
| RRDC Screening Review (Surface Water)      | There are a number of options that BMC can utilize to prevent UWMP from overflowing during a storm event:<br>a) The UWMP has been designed for the 1 in 200 year storm event.<br>b) The UWMP has a spill way that connects to the LWMP, which any excess water would flow into the LWMP during a storm/flood event if required.<br>c) Excess water in the UWMP would be directed to the open pit and following the storm event would be sent to the pit rim pond and then through the water treatment plant (as required).<br>d) The water treatment plant has been oversized and in year two will only operate at 60% capacity, therefore in a storm event water in the UWMP could be sent to the treatment plant. | See Section 4.2 and Section 6.3.2 of the Water Management Plan                                                                                                                                                                                                                                                    |
| RRDC Screening Review (ARD/ML)             | All of the Class B collection pond seepage is modelled to go to the water treatment plant during Operations and Active and Transition Closure (i.e., similar to Class A) (BMC, 2018b). As part of the detailed design work to support permitting and construction, BMC will perform sensitivity testing to assess if Class B effluent requires treatment to meet receiving environment water quality objectives during the Operations and Active and Transition Closure phases; however, the plan at present is that the Class B seepage will be treated.                                                                                                                                                           | See Section 6.2.2 of the Water Management Plan<br><br>Note that modelling completed after making this commitment demonstrates that treatment through the WTP will not be required during the Operations Phase. In practice, routing of water in the Class B Collection Pond will be determined following testing. |
| RRDC Screening Review (ARD/ML)             | As indicated above, Class B seepage is modelled as being treated. Refinements to the water management plan may be undertaken in the future to establish criteria that govern when Class B seepage is treated or not but these criteria will be tested via a careful and well defined water monitoring program.                                                                                                                                                                                                                                                                                                                                                                                                      | See Section 6.2.2 of the Water Management Plan<br><br>Note that modelling completed after making this commitment demonstrates that treatment through the WTP will not be required during the Operations Phase. In practice, routing of water in the Class B Collection Pond will be determined following testing. |
| RRDC Screening Review (Fish and Wildlife)  | Once fault creek is diverted a barrier will be placed at its lower end to prevent fish from using the creek so that it doesn't become temporary fish habitat.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | See Section 6.3.8 of the Water Management Plan                                                                                                                                                                                                                                                                    |
| BMC Response to Public Comments on the DSR | The water balance (including the sensitivity analysis) will be further updated and submitted to the Water Board and Yukon Government's Department of Energy, Mines and Resources to support BMC's Type A Water Licence application and Quartz Mining Licence application, respectively.                                                                                                                                                                                                                                                                                                                                                                                                                             | See Section 5.1 of the Water Management Plan                                                                                                                                                                                                                                                                      |
| BMC Response to LFN Comments on the DSR    | The laboratory treatability study showed that water treatment plant will perform as described in the Project Proposal and Response Reports. This study will be included in BMC's Type A Water Licence Application.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | See Section 6.3.10 of the Water Management Plan                                                                                                                                                                                                                                                                   |
| BMC Response to LFN Comments on the DSR    | Pilot-scale testing of the active treatment system has been ongoing throughout the Project planning and was completed to support the Feasibility study. Reporting associated with this testing will be included as part of the Water Licence (WL) application.                                                                                                                                                                                                                                                                                                                                                                                                                                                      | See Section 6.3.10 of the Water Management Plan                                                                                                                                                                                                                                                                   |
| BMC Response to LFN Comments on the DSR    | EQS have been calculated for the LWMP and will form part of BMC's WL application.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | See Section 4.3.1 of the Water Management Plan                                                                                                                                                                                                                                                                    |



| Reference No.                                                                                  | Proponent Commitment / Mitigation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Where addressed                                                                                                                                           |
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| BMC Response to LFN Comments on the DSR                                                        | Based on the recommendations provided in the final Screening Report and the Decision Document, BMC will be refining Project details and water management plan to ensure the licence applications meet the terms and conditions sent out in the Decision Document and to meet the guidance for Water Licence and Quartz Mining Licence applications.                                                                                                                                                                                                                                                                                    | Recommendations from the Final Screening Report and Decision Document as they relate to Water Management have been included in the Water Management Plan. |
| Project Proposal Chapter 8 (BMC, 2017a)                                                        | Water quality objectives have been established and will be incorporated into the adaptive management plan to mitigate potential effects to surface water quality.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | See Section 4.3 of the Water Management Plan                                                                                                              |
| Project Proposal (BMC, 2017a)                                                                  | The following conceptual management plans (presented in the Project Proposal) outline mitigation measures to minimize potential effects to surface water from Project activities: <ul style="list-style-type: none"> <li>o Waste Management Plan (Section 18.2);</li> <li>o Hazardous Materials Management Plan (Section 18.3);</li> <li>o Surface Water Management Plan (Section 18.4);</li> <li>o Spill Response Plan (Section 18.5);</li> <li>o Sediment and Erosion Control Plan (Section 18.6);</li> <li>o Waste Rock Management (Section 4.9); and</li> <li>o Conceptual Reclamation and Closure Plan (Appendix H-1).</li> </ul> | See Section 6.1.2 of the Water Management Plan                                                                                                            |
| Project Proposal Chapter 8 (BMC, 2017a)                                                        | Effluent quality standards will be established during the Water Use Licensing to mitigate potential effects and the Project will be subject to effluent standards under Metal and Diamond Mine Effluent Regulations.                                                                                                                                                                                                                                                                                                                                                                                                                   | See Section 4.3.1 of the Water Management Plan                                                                                                            |
| Project Proposal Chapter 8 (BMC, 2017a)                                                        | Manage ABM open pit development water in Pit Rim Pond to settle Total Suspended Solids and aerate water.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | See Section 6.2.1 and Section 6.3.7 of the Water Management Plan                                                                                          |
| Project Proposal Chapter 8 (BMC, 2017a)                                                        | Line Fault Creek diversion ditch.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | See Section 6.3.8 of the Water Management Plan                                                                                                            |
| Project Proposal Chapter 8 (BMC, 2017a)                                                        | Energy dissipation structure at Fault Creek diversion outlet to South Creek catchment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | See Section 6.3.8 of the Water Management Plan                                                                                                            |
| Project Proposal Chapter 8 (BMC, 2017a) and BMC Response on Draft Screening Report (BMC, 2020) | Construction of Water Treatment Plant which will remain on site until the closure objectives are met in the receiving environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | See Section 6.3.10 of the Water Management Plan                                                                                                           |
| Project Proposal Chapter 8 (BMC, 2017a)                                                        | Discharge at minimum dilution ratios to Geona Creek and Finlayson Creek.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | See Section 4.4 of the Water Management Plan                                                                                                              |
| Project Proposal Chapter 8 (BMC, 2017a)                                                        | Upper Water Management Pond, Lower Water Management Pond, Pit Rim Pond, Class A and B Storage Facilities Water Collection Ponds will be constructed with a high-density polyethylene liner.                                                                                                                                                                                                                                                                                                                                                                                                                                            | See Section 6.3 of the Water Management Plan                                                                                                              |
| Project Proposal Chapter 8 (BMC, 2017a)                                                        | Fault Creek and other small portions of the upper Geona Creek catchment which would drain to the ABM open pit will be diverted into South Creek to mitigate the volume of water becoming contact water in Geona Creek during the Construction and Operations phases of the Project.                                                                                                                                                                                                                                                                                                                                                    | See Section 6.3.8 of the Water Management Plan                                                                                                            |
| Project Proposal Chapter 8 (BMC, 2017a)                                                        | Diversions around all other Project infrastructure will drain to the north of the Lower Water Management Pond to reduce the volume of contact water and help maintain natural runoff regimes in the receiving environment.                                                                                                                                                                                                                                                                                                                                                                                                             | See Section 6.3 of the Water Management Plan                                                                                                              |
| Project Proposal Chapter 9 (BMC, 2017a)                                                        | Class A and B Storage Facilities will be constructed with very low permeability composite liner and cover systems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Section 6.3.3 and Section 6.4.4 of Water Management Plan                                                                                                  |
| Project Proposal Chapter 9 (BMC, 2017a)                                                        | Upper and Lower Water Management Ponds, Pit Rim Pond, and Class A and B Facility Water Collection Ponds will be constructed with an impermeable synthetic (high-density polyethylene) liner.                                                                                                                                                                                                                                                                                                                                                                                                                                           | See Section 6.3 of the Water Management Plan                                                                                                              |
| Project Proposal Chapter 9 (BMC, 2017a)                                                        | Dewatering system will be designed to minimize the required groundwater extraction and associated drawdown of the groundwater table.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | See Section 6.2.1.4 of the Water Management Plan                                                                                                          |

| Reference No.                            | Proponent Commitment / Mitigation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Where addressed                                                  |
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| Project Proposal Chapter 11 (BMC, 2017a) | Minimize land clearing to the areas necessary for Project Footprint.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | See Section 6.4 of the Water Management Plan                     |
| Response Report #3 (BMC, 2017c)          | For the Upper and Lower Water Management Ponds BMC will pre-strip all overburden with permafrost (to bedrock or competent, ice-free material) within the pond and dam footprints, and extend stripping long the pond perimeter/berm, including the immediate upslope area. Ensure the dam foundation is keyed into competent, ice-free material. Monitor and manage (as required) the stripped areas above the pond perimeter/berm for deposition of localized mass movements. Where required, implement spur road construction techniques specifically designed for ice-rich permafrost. | See Section 6.3.1 and Section 6.3.2 of the Water Management Plan |
| Response Report #4A (BMC, 2018b)         | Wildlife and Wildlife Habitat - In order to minimize the effects on wildlife and wildlife habitat, BMC has minimized the Project footprint so that all Project infrastructure is confined to one watershed. By minimizing the impact to the habitat, the effects on the land users who use the land base for hunting the wildlife are also reduced.                                                                                                                                                                                                                                       | See Chapter 6 of the Water Management Plan                       |
| RRDC Review of Draft Management Plan     | Water Management infrastructure will be first priority of construction to manage flows and prevent downstream sedimentation.                                                                                                                                                                                                                                                                                                                                                                                                                                                              | See Chapter 6 of the Water Management Plan                       |
| RRDC Review of Draft Management Plan     | The water model shows that with sediment removal the water be able to be directly discharged to the environment during construction without the need for treatment. This will be monitored prior to discharge and if it doesn't meet the WQO then the contingency will be to have a mobile treatment plant already on-site to treat the water.                                                                                                                                                                                                                                            | See Chapter 6 of the Water Management Plan                       |
| Decision Document Term #2                | The proponent shall advance development of the water treatment plant (WTP) design and confirm expected performance for all relevant Contaminants of Potential Interest (COPI) during licensing to optimize design and ensure timely implementation.                                                                                                                                                                                                                                                                                                                                       | See Section 6.3.10 of the Water Management Plan                  |
| Decision Document Term #5                | Prior to licencing, and as necessary, the Proponent shall revise the use-protection water quality objectives to ensure they incorporate the most recent toxicological information and guidance from Canadian Council of Ministers of the Environment (CCME) and British Columbia Ministry of Environment (BCMoE) for the protection of freshwater aquatic life                                                                                                                                                                                                                            | See Section 4.3.2 of the Water Management Plan                   |
| Decision Document Term #6                | The Proponent shall establish effluent quality standards for the Project based on achieving water quality objectives (WQOs) in the receiving environment in Geona Creek (KZ-37) and in Finlayson Creek (KZ-15).                                                                                                                                                                                                                                                                                                                                                                           | See Section 4.3 of the Water Management Plan                     |
| Decision Document Term #9                | The Proponent shall ensure the water treatment plant (WTP) remains operational until it has been demonstrated that surface water from the site meets water quality objectives (WQO) for the receiving environment in Geona Creek (KZ-37) and in Finlayson Creek (KZ-15).                                                                                                                                                                                                                                                                                                                  | See Section 6.3.10 of the Water Management Plan                  |
| Decision Document Term #34               | The Proponent shall provide, as part of regulatory applications, the worst-case scenario estimate for water quality predictions for Geona Creek and Finlayson Creek, and responsible regulatory authorities shall use this data to reduce the uncertainty in water quality predictions for the Project and establish appropriate water quality standards or objectives.                                                                                                                                                                                                                   | See Section 5.2 of the Water Management Plan                     |
| Decision Document Term #35               | The Proponent shall develop an updated Water Quality Model and a comprehensive Adaptive Management Plan to be included in the licensing process. The Adaptive Management Plan shall address potential changes in water quality in Geona Creek downstream of the constructed wetland treatment system. The Adaptive Management Plan shall include early warning triggers and identify effective and timely mitigation measures to ensure protection of water quality.                                                                                                                      | See Section 5.2 of the Water Management Plan                     |
| Decision Document Term #39               | The Proponent shall have a water treatment plant constructed and commissioned prior to placing material in the Class A facility.                                                                                                                                                                                                                                                                                                                                                                                                                                                          | See Section 6.3.10 of the Water Management Plan                  |



| Reference No.              | Proponent Commitment / Mitigation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Where addressed                                |
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| Decision Document Term #40 | The water quality of any mine affected water flowing into proposed fish habitat offsetting must at a minimum meet the use protection or Canadian Council of Ministers of the Environment (CCME) requirements for the protection of freshwater aquatic life.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | See Section 4.3.2 of the Water Management Plan |
| Decision Document Term #44 | <p>The Proponent shall submit, to the Government of Yukon, a performance audit report on the actual performance of mine components relative to approved design or expected performance. The Proponent shall provide RRDC and LFN with a copy of any performance audit report submitted to the Government of Yukon under this term subject to the redaction of confidential material.</p> <p>a. The report must be of sufficient detail to enable an understanding of current performance and to identify trends that could materially affect mine outcomes.</p> <p>The timing and frequency of reporting shall be indicated by the Government of Yukon regulator.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | See Section 6.3 of the Water Management Plan   |
| Decision Document Term #45 | <p>Prior to the commencement of operations of an Engineered Structure, and at any time or frequency indicated by the Government of Yukon, the Proponent shall submit a third-party engineering audit for that facility.</p> <p>The Proponent shall provide RRDC and LFN with a copy of any third-party engineering audit report submitted to the Government of Yukon under this term subject to the redaction of confidential material. The audit must be sufficiently detailed to provide an independent assessment of whether the facility has been constructed and is capable of operating in accordance with approved designs, specifications, and operating plans.</p> <p>Each engineering audit must:</p> <ol style="list-style-type: none"> <li>be prepared by a qualified independent professional engineer or engineering firm acceptable to the Government of Yukon;</li> <li>be funded by the Licensee;</li> <li>assess whether the Engineered Structure has been constructed in accordance with approved designs, permits, and specifications;</li> <li>assess the readiness of the facility to operate safely and effectively within its design parameters;</li> <li>identify any deficiencies, departures from approved designs, commissioning issues, or conditions that may affect operational performance, environmental protection, or closure obligations, and;</li> <li>satisfy any scope requirements identified by the Government of Yukon.</li> </ol> <p>Where an engineering audit identifies deficiencies or conditions requiring corrective action, the proponent must address those deficiencies to the satisfaction of the Government of Yukon prior to commencing or continuing operation.</p> | See Section 6.3 of the Water Management Plan   |