

# COPPER MOUNTAIN MINE

## INFORMATION SUMMARY - APPLICATION FOR AMENDMENT TO EMA PERMIT 00261



Copper Mountain Mine (BC) Ltd. (CMML), a subsidiary of Hudbay Minerals Inc., have submitted an amendment application to the Director of the Ministry of Environment and Climate Change Strategy (ENV) requesting an amendment to CMML’s *Environmental Management Act* effluent discharge Permit 00261 for the Copper Mountain Mine. The Amendment Application (ENV Tracking Number 415998) requests conditions to be added to the Permit for authorization to resume discharge to the Similkameen River from the following three mine site drainages:

- Water from the West Dam Seepage Collection System of the Tailings Management Facility (TMF; Permit 00261 monitoring station SW07);
- Groundwater from the historic Level 6 Adit of historic underground working underlying the current pit development area (Permit 00261 monitoring station SW09); and
- Natural drainage on the southwest side of the main Non-Economic Rock Storage Area (NERSA; Permit 00261 monitoring station SW38).

The application includes a Technical Assessment Report that provides the data and information requested by ENV for this application. The report was prepared by qualified environmental professionals from Hatfield Consultants in collaboration with SRK Consulting. This Information Summary document provide a brief summary of information from the Technical Assessment Report and recommended permit limits, monitoring and management plans to ensure the protection of the aquatic environment in the Similkameen River. The locations

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of the proposed discharge points are shown on Figure 1 below, along with other existing and proposed Permit 00261 monitoring locations.

**BACKGROUND**

Copper Mountain Mine (CMM) is an open-pit copper mine in British Columbia located in the Similkameen River watershed, approximately 15 km upstream of its confluence with the Tulameen River at the town of Princeton. Although mine operations occurred historically above both the east and west banks of the Similkameen River, current mine activities authorized under *Mines Act* Permit M-29 are focused on the east side of the river, in an upland area between the Similkameen River and upper Wolfe Creek. Wolfe Creek is itself a tributary to the Similkameen River.

Discharges from the CMM site are provincially regulated under the BC *Environmental Management Act* (EMA) effluent discharge Permit 00261. The three mine site drainages in this amendment application have historically flowed to the Similkameen River under authorization of Permit 00261. The authorized discharge period for West Dam seepage (SW07) and the Level 6 Adit drainage (SW09) ended on December 31, 2018. The southwest NERSA drainage, more commonly referred to as the SW38 drainage, is a small pre-existing natural groundwater spring and stream channel that previously only required routine water quality monitoring under Permit 00261. However, the drainage has in recent years become influenced by the development of a NERSA within its catchment area, and now requires authorization under Permit 00261 to allow it to resume flowing to the Similkameen River.

All three of these mine site drainages have had pumpback systems installed since 2019 which collect and pump the waters to mine pits or the TMF for use as mill process water and dust suppression. Completion of a Best Achievable Technology (BAT) assessment was required under Permit 00261 before ENV would consider an application to resume discharge from these drainages. The BAT assessment and implementation plan was completed for CMM by SRK Consulting and submitted to ENV on May 15, 2019, and a letter of approval of the BAT was issued by ENV on December 19, 2019. The completed BAT assessment proposed strategies that could be implemented by CMM to reduce loadings of constituents of interest (COIs) into the receiving environments of Wolfe Creek and, if needed, the Similkameen River and continue to achieve permitted limits and site water quality objectives at compliance stations (i.e., BC water quality guidelines or site performance objectives).

COIs, with respect to mine drainage waters, are natural chemical compounds referred to as constituents that either have concentrations greater than the BC approved water quality guidelines or have concentrations that are predicted to approach or increase above applicable guidelines in the receiving environment.

The BAT assessment did not identify any chemical constituents of potential concern associated with mining activities for the Similkameen River at the downstream-of-mine monitoring station SW12A, including with the potential influence of continuous discharge from the three drainages listed above. The BAT assessment, and associated water and load balance modeling, showed that only a few parameters in the mine drainages cause measurable changes to water quality in the Similkameen River and all such changes are far below the lowest BC water quality guideline levels. Copper is commonly elevated above aquatic life guideline concentrations; however, modeling shows that most of the copper in the river cannot be accounted for by the CMM mine

drainages. These modelling results are supported by the results from water samples collected from the river which show little change in COI concentrations before and after pumpback of the three drainages was initiated.

The Similkameen River downstream of the mine continues to be of good quality directly downstream of CMM and is predicted to remain so with discharge from the three drainages. However, the assessment of BATs provided recommendations and implementation plans for the drainages reporting to the Similkameen River to reduce loadings of various COIs, namely sulphate, nitrate, copper, selenium, and molybdenum, if determined to be necessary. Subsequent assessments of the initial dilution zone (IDZ) and ecological risks to wildlife, as recommended in the BAT assessment, have been completed and indicated pumpback of the Level 6 Adit and SW38 drainages are not necessary to maintain good water quality in the river downstream of the mine site.

For the TMF West Dam seepage, the BAT recommended a resumption of seepage drainage flow to the Similkameen River. Releasing water from the TMF is important for the TMF and site water management and for minimizing the buildup of sulphate concentrations in TMF water. Minimizing the buildup of sulphate in TMF water is important because a portion of the TMF water exists as unrecoverable groundwater that flows to the Wolfe Creek catchment and therefore has the potential to affect water quality and aquatic organisms in Wolfe Creek because of the considerably lower flows in Wolfe Creek compared to the Similkameen River.

CMM has completed all approved primary BAT implementation measures and studies that were recommended for the Similkameen River, as well as those recommended for the Wolfe Creek catchment. Pumpback systems have been installed and are operational on all three drainages. The pumpback systems provide interception and pumpback until discharge from the drainages is approved in an amendment of Permit 00261, and subsequently to be available when needed if water quality and or quantity does not meet the authorized discharge limits.

This Amendment Application has been submitted by CMM to obtain authorization to resume discharge from three mine site drainages to the Similkameen River, as per the findings of the approved BAT assessment and implementation plan.

**TECHNICAL ASSESMENT SUMMARY**

The Technical Assessment Report for the proposed discharge of three mine site drainages to the Similkameen River concluded the following:

- The resumption of CMM discharges to the Similkameen River is recommended as long as some adaptive management is included;
- Drainages from the Level 6 Adit (SW09) and Southwest side of the NERSA (SW38) could be fully discharged between October 1 and June 15; however, pumpback to the pits or TMF is recommended between June 16 and September 30 to avoid nutrient enrichment effects in the Similkameen River, with the exception of SW09 if the drainage flows are less than 1 L/s;
- The TMF West Dam Seepage (SW07) could also be discharged, as long as partial pumpback is implemented during Similkameen River low flow conditions to avoid potential effects of dissolved copper. The proposed allowable discharge flow rate is dependent on Similkameen River flows; and

- With adaptive management, the proposed permit limits (below) are unlikely to cause adverse environmental effects. A monitoring program with adaptive management responses is also proposed.

The following subsections provide a summary of information from the Technical Assessment Report with respect to recommended permit discharge requirements, and associated monitoring and adaptive management plans.

**PROPOSED DISCHARGE LIMITS AND FLOW RATES**

The Technical Assessment Report proposes discharge limits and a safe discharge plan that will enable CMM to discharge water from the three mine drainages to the Similkameen River without deleterious effects to the Similkameen River. The table below provides a summary of the proposed discharge quality limits, flow rates, and discharge period for each of the three drainages.

Parameter	Proposed Permit Limits by Discharge Location		
	CMM Station SW07	CMM Station SW09	CMM Station SW38
	Water from the West Dam Seepage Collection System of the Tailings Management Facility	Groundwater from the Level 6 Adit of historic underground works	Natural drainage from southwest side of the main non-economic rock storage area
<b>Discharge Periods and Rates</b>			
Discharge Period	24 hours per day, 7 days per week.	24 hours per day between October 1 and June 15; Maximum 3 days between June 16 and September 30, unless flows are 1 L/s or less	24 hours per day between October 1 and June 15; Maximum 3 days between June 16 and September 30
Maximum Discharge Rate	Variable. Maximum discharge rate decreases as river flow rates decrease. Maximum Discharge (L/s) = $0.0257x - 0.3307$ where x is Similkameen River flow rate in L/s at discharge confluence.	None specified as flows are predicted to remain very low (average annual flow predicted to be less than 9.0 L/s during mine operations)	None specified as flows are predicted to remain very low (average annual flow predicted to be less than 3.2 L/s during mine operations)
<b>Discharge Quality (Maximum Monthly Average Concentrations in mg/L)</b>			
Nitrate	NA	42	109
Sulphate	1,100	1,300	1,900
Dissolved Copper	0.0036	0.042	0.020
Total Molybdenum	0.16	0.28	NA
Total Selenium	NA	0.018	0.041
Total Uranium	NA	0.019	NA

NA = not applicable. Existing and predicted concentrations for the indicated drainage are below the lowest applicable BC water quality guideline. Therefore, a permit limit is not required.

## **MONITORING AND MITIGATION PLAN**

CMM currently undertakes a wide array of aquatic environmental monitoring activities that track the quantity and quality of mine contact waters and conditions in the surrounding receiving environments. Under Permit 00261 requirements, this currently includes routine water quality sampling and flow or water level measurements at 32 surface water monitoring locations and 15 groundwater monitoring wells. In addition, the aquatic biological effects monitoring program includes routine toxicity testing of select surface water locations and annual biological effects studies in the Similkameen River and Wolfe Creek to assess the health of aquatic organisms downstream of the mine site. In the Similkameen River, monitoring is conducted at five water quality monitoring sites along the river between the East Gate of Manning Park and Bromley Rock Provincial Park, covering a total length of approximately 55 km. Four of the surface water monitoring locations are also biological effects monitoring areas.

Generally, these existing monitoring programs will provide sufficient data to describe and understand the mine's influences on aquatic environments and provide data and information for use in adaptive management. Some additions and changes to the current monitoring programs in the Similkameen River catchment are recommended to ensure the proposed discharges and associated permit limits are protective of the aquatic environment in the river. These include:

- Increased monitoring during discharge from SW07, SW09 and SW38; weekly water quality and flow rate measurements are proposed, and routine toxicity testing.
- If no discharge occurs in a calendar quarter, water quality and flow rates are to be collected quarterly at proposed new monitoring stations located upgradient of the SW07, SW09, and SW38 discharge points and associated pumpback systems (SW63, SW76, SW77 and SW79). This provides continued long-term characterization of these drainages systems even when not discharging.
- Before and weekly during discharge of West Dam seepage at SW07, real-time Similkameen River flows from the Water Survey of Canada (WSC) hydrometric station 08NL007 (Similkameen River at Princeton) will be reviewed to determine the maximum allowable SW07 discharge flow rate for that week.
- Annual water sampling in the Similkameen River at 100 m downstream of the confluence with West Dam seepage drainage channel (SW78). This sampling is to be done during the summer or fall low-flow conditions when SW07 is discharging, as this location is not safely accessible during higher river flow periods.
- Monitoring of the aquatic habitat at the end of the IDZ for each drainage annually in the year before and three years after discharges resume. This would be done during the summer or fall low flow conditions along with the routine annual biological effects monitoring program (BEMP) studies.

The locations of existing and proposed new surface water and groundwater monitoring stations in the Similkameen River catchment for Permit 00261 are show in Figure 1 below, with new monitoring locations identified with yellow highlighting. The locations of Permit 00261 BEMP study areas are shown on Figure 2.

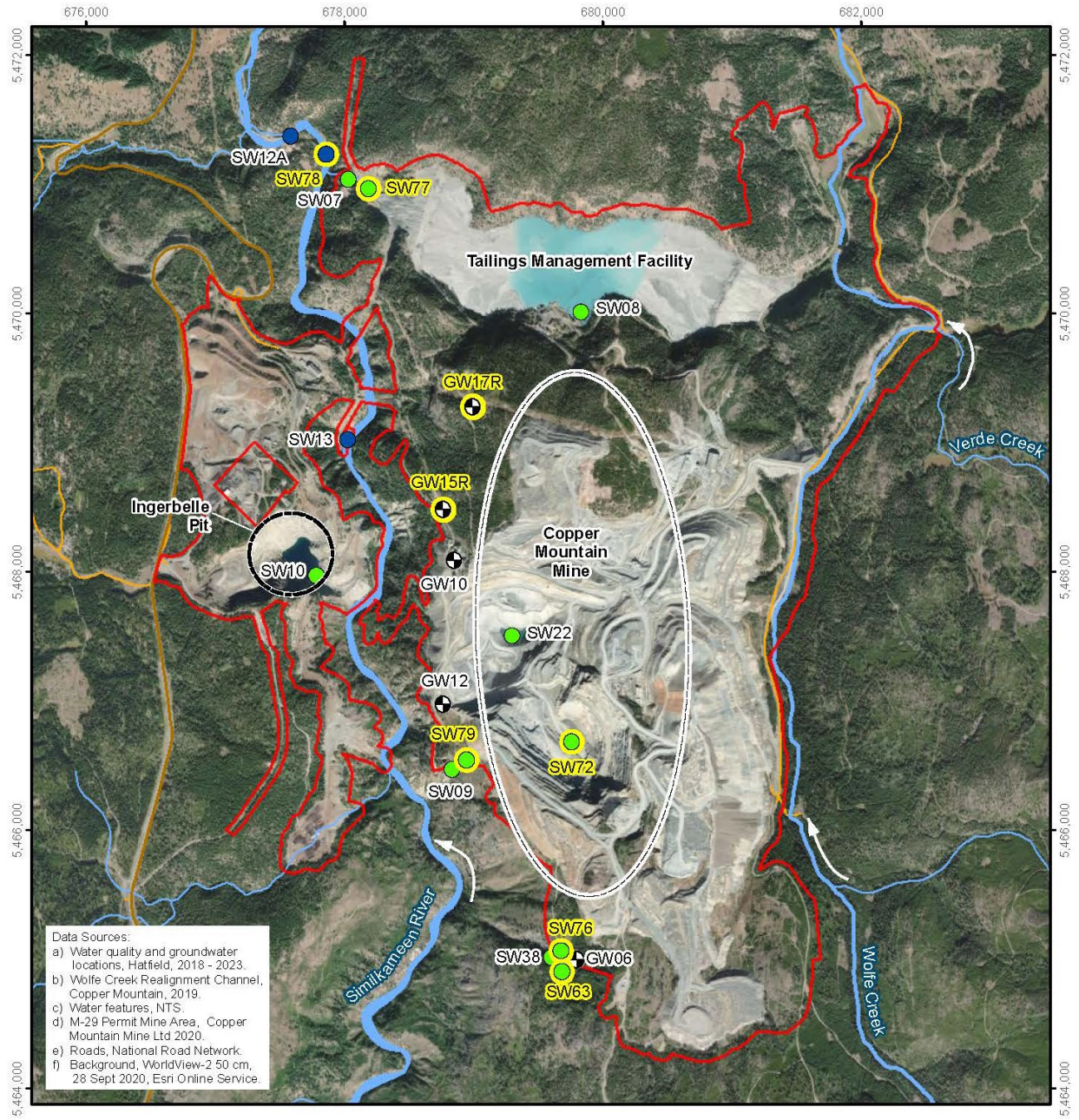
In addition to the routine monitoring programs, the following additional assessments are proposed:

- IDZ Confirmatory Assessment - A water sampling event along a transect across the Similkameen River at the 100m extent of the mixing zone of the SW07 and SW38 drainages during low river flow conditions when there is discharge from these drainages. Assessment to be conducted within the first year to confirm/validate the IDZ model predictions that were used to derive the proposed discharge limits.
- Selenium Speciation Assessment – Some forms of selenium compounds are more prone to bioaccumulation in aquatic organisms. An assessment of selenium speciation in the mine drainages and Similkameen River is proposed to be conducted within the first year after discharges commence, during low river flow conditions, and when SW07, SW09, and SW38 are discharging to the river.
- Fish Tissue Assessment - Collection of additional fish tissues before and after discharges resume to assess selenium concentrations, including rainbow trout eggs from routine BEMP stations and sculpin tissue (whole body and eggs) collected immediately downstream of the IDZ for each drainage.

Adaptive management plans are detailed in the Technical Assessment Report, including details on triggers for implementation of mitigation measures. Given that each of the three mine drainages is already equipped with collection and pumpback systems, the primary mitigation measure for each of the proposed discharges is to activate the pumpback system to stop the discharge flow to the Similkameen River, if monitoring of the mine drainage or Similkameen River indicates it is necessary. Discharge would not resume until additional sampling and investigations determine that the drainage water meets the permitted discharge quality limits, toxicity testing indicates no acute toxicity, and the underlying cause of the original trigger is no longer a potential concern.

A copy of the permit application, including supporting documentation, is available electronically upon request. To request a copy of the permit application or other information related to this application, please contact Colleen Hughes at [coppermountaininfo@hudsonbayminerals.com](mailto:coppermountaininfo@hudsonbayminerals.com) or 250-293-0408.

**Figure 1: Map of Existing and Proposed Permit 00261 Water Quality Monitoring Stations in the Similkameen River Catchment**



**Legend**

- Permit 00261 Groundwater Monitoring Well
- Permit 00261 Receiving Watercourse Water Quality Monitoring Station
- Permit 00261 Mine Contact Surface Water Quality Monitoring Station
- Proposed New Permit 00261 Monitoring Station
- Watercourse
- Road
- BC Highway 3
- M-29 Permit Mine Area



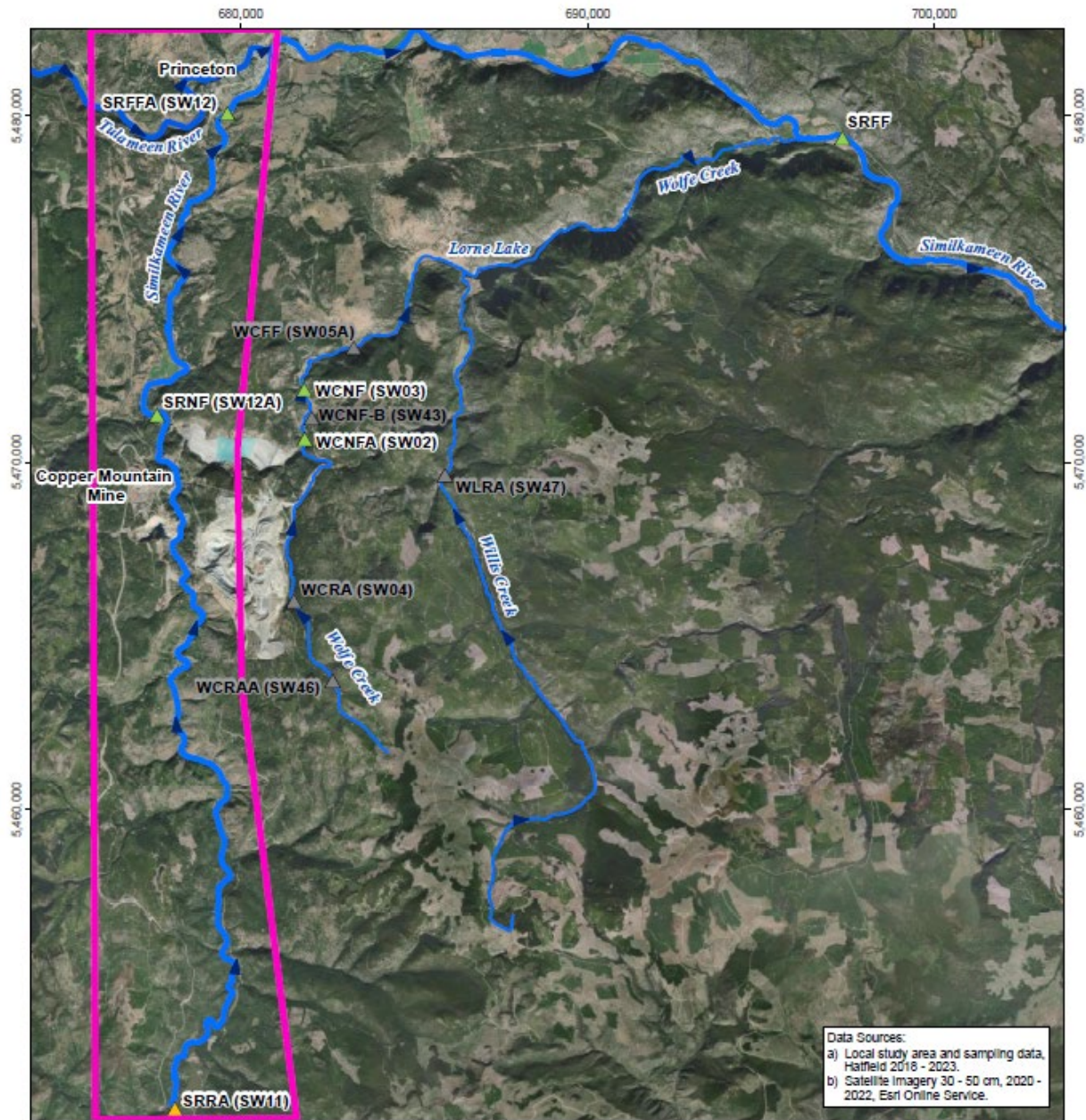
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**Figure 2: Map of Permit 00261 Biological Effects Monitoring Program Study Areas for Copper Mountain Mine**



Data Sources:  
 a) Local study area and sampling data, Hatfield 2018 - 2023.  
 b) Satellite Imagery 30 - 50 cm, 2020 - 2022, Esri Online Service.

**Legend**

- Local Study Area
- Biological Effects Sampling Locations**
- ▲ Adjacent to mine or within mine property
- ▲ Downstream of mine
- ▲ Not influenced by mine (reference locations)
- ▲ Not discussed in Similkameen TAR



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 Scale: 1:170,000  
 Projection: NAD 1983 UTM Zone 10N



**Copper Mountain - Similkameen River TAR**  
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