IN THE SUPREME COURT OF THE STATE OF MONTANA
No. DA 23-0268

MONTANA TROUT UNLIMITED, TROUT UNLIMITED, MONTANA ENVIRONMENTAL INFORMATION CENTER, EARTHWORKS, and AMERICAN RIVERS,

Petitioners and Appellants,

v.

MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION and TINTINA MONTANA, INC.,

Respondents and Appellees.

APPENDIX TO APPELLEE TINTINA MONTANA, INC.'S RESPONSE BRIEF

On Appeal from the Montana Fourteenth Judicial District Court
Meagher County, Hon. Michael Hayworth
Cause No. DV-2022-09

W. John Tietz
Hallee C. Frandsen
BROWNING, KALECZYC,
BERRY & HOVEN, P.C.
800 N. Last Chance Gulch, Ste 101
P.O. Box 1697
Helena, MT 59624
(406) 443-6820
(406) 443-6883 (fax)
john@bkbh.com
hallee@bkbh.com

TABLE OF CONTENTS

APPENDIX A

Prepared for:

DEQ Montana Department of Environmental Quality

Black Butte Copper Project Final Environmental Impact Statement

February 2020

TABLE OF CONTENTS

Sheep Creek is included in DEQ's 303(d) list of impaired streams for dissolved aluminum and *Escherichia coli* (*E. coli*), with sources listed as grazing in riparian zones, disturbances associated with human activities, and natural sources. DEQ published a document in 2017 specifically focused on the TMDL for *E. coli* and a framework water quality improvement plan for Sheep Creek in the Sheep Creek TMDL Project Area (DEQ 2017). The iron and aluminum exceedances are likely related to increased turbidity during periods of snowmelt and high runoff (with some exceptions), as the exceedances occur during peak runoff periods when turbidity is high. Elevated dissolved aluminum values associated with high turbidity have been observed in many different geographic areas during high-flow events (e.g., Moose Creek on 303(d) list, tributary to Sheep Creek below the Project area).

DEQ conducted a broad monitoring program in the Sheep Creek drainage for further data collection. The data DEQ collected is being used to develop an aluminum TMDL. The TMDL is necessary as a result of § 75-5-702, MCA, the discharge permit application and the aluminum impairment determination (303[d] list). DEQ conducted a broad water quality monitoring program in the Sheep Creek drainage that was used to update baseline data and existing impairment determinations for several streams, including Sheep Creek. The data were used to complete an *E. coli* TMDL and will be used for an aluminum TMDL. The completion schedule for the aluminum TMDL is linked to the MPDES surface water permit completion schedule to ensure internal DEQ consistency. The aluminum water quality standard is identified in the State of Montana Water Quality Standards (DEQ 2017), and the aquatic life aluminum standards were set at 0.75 mg/L and 0.087 mg/L for acute and chronic standards, respectively.

3.5.3. Environmental Consequences

This section describes the potential impacts of the Project on surface water quantity and quality, including temperature. Groundwater quality is described in section 3.4.

3.5.3.1. Surface Water Quantity

No Action Alternative

Under a No Action Alternative, there would be no environmental consequences to surface water quantity in the Project area. Without the mine, the timing and magnitude of stream and spring flow would be unchanged from the existing conditions of the affected environment.

Proposed Action

The Proposed Action outlined in the Project's MOP Application (Tintina 2017) describes operations that could potentially affect surface water quantity though construction, operations, reclamation, and closure phases. Planned operations and facilities that could have direct or secondary impacts on surface water quantity are listed below:

- Surface disturbance by major facilities that could result in the interception and storage of surface water;
- Diversion of stream flow to the NCWR using the wet well during high-flow conditions;

- Dewatering associated with underground mine operations (access tunnels, ventilation shafts, mining stopes); and
- Operation of the Sheep Creek Alluvium UIG.

The following discussion of the Project's potential impacts on surface water quantity is organized by each of the planned operations.

Interception and Storage of Surface Water

Construction and operations of the mine would result in areas of surface disturbance that may result in changes to surface runoff patterns. Mining operations would also store and treat contact water prior to being discharged to the environment. **Table 2.2-1** lists the Project's facilities, features, and access roads and presents the measured acres of disturbance associated with each facility (Tintina 2017).

The total disturbed surface area is 310.9 acres, including a 10 percent construction buffer zone that would potentially affect the pattern and volume of surface runoff. Storm water runoff would be collected from the mill area, areas of direct underground mining support, WRS pad, copper-enriched rock storage pad, and the CTF, which would cover an area of approximately 112.3 acres (see **Table 2.2-1**). Contact storm water runoff from these facilities would be collected and stored in a CWP. Water from the CWP would be treated via the WTP and released to the environment through the alluvial UIG. To reduce the volume of contact storm water runoff in the disturbance area, storm water control and management BMPs would be implemented as required for the Storm Water Pollution Prevention Plan. BMPs are provided in the MOP Application (Tintina 2017) as well as Section 4.5 of the Integrated Discharge Permit Application Narrative (Hydrometrics, Inc. 2018c). BMPs would be used to minimize erosion and sedimentation, and to control surface and storm water runoff at the Project site. BMPs include but are not limited to:

- Suspend construction dirt work during periods of heaviest precipitation and runoff to minimize soil disturbance and erosion.
- Hydroseed or revegetate cut and fill slopes and disturbed natural slopes as early as possible.
- Use mulches and other organic stabilizers to minimize erosion until vegetation is established on sensitive areas.
- Isolate cleared areas and building sites with diversion channels, ditches, and swales to redirect runoff.
- Retain natural drainage patterns wherever possible.
- Install runoff diversion ditches that are primarily located at surface facilities and separate contact storm water and non-contact storm water.
- Line unavoidably steep interceptor or conveyance ditches with filter fabric, rock, polyethylene lining, or armoring to prevent channel erosion.
- Construct stable, non-erodible ditches, and inlet and outlet structures.
- Construct, operate, and maintain sediment control ponds.

The disturbed surface area (310.9 acres) is a relatively small area within the overall Sheep Creek watershed, which drains a total of 124,160 acres at its mouth. The disturbed area is also a small area relative to the total drainage area monitored by surface water gaging station SW-1, located just greater than 1 mile downstream of the Project area (50,162 acres). The percent disturbance (including a 10 percent buffer zone) is less than 1 percent of both the entire Sheep Creek drainage area and of the watershed area associated with station SW-1. Based on the small percentage of disturbed area, it is not expected that surface runoff would change; therefore, impacts on surface water quantity in the affected watershed would not be adverse.

Several tributaries to Sheep Creek are in the immediate vicinity of the Project including Coon Creek and Little Sheep Creek, which converges with Brush Creek southeast of the Project. Surface runoff in these smaller drainages could potentially be affected due to surface disturbance, but impacts would not extend outside the immediate area and therefore are considered low within the greater Sheep Creek watershed.

Within the jurisdictional study and lease boundary area from USACE (**Figure 3.14-1**), a total of 327.4 acres of wetlands and 16.3 miles of streams were identified. A variety of locations were considered for proposed facilities to identify a practicable alternative with minimal impacts to wetlands and streams. The Proposed Action would disturb only 0.85 acre of the wetlands and 696 lineal feet of the streams, which account for less than 1 percent of the total area of each of these surface water features. Additionally, BMPs would be implemented to reduce impacts on these features including the use of half-culverts spanning the channels of Brush Creek and Little Sheep Creek where the main access road intersects them and the use of a directional utility installation drill to avoid impacts on streams and wetlands during the installation of underground pipelines. Impact on surface water quantity in the streams and wetlands due to surface disturbance are insignificant based on the proposed BMPs detailed in the MOP Application (Tintina 2017) and the relatively small percentage of the total area of these features that would be impacted through construction disturbance.

Diversion of Stream Flow to the Non-Contact Water Reservoir

The purpose of the design and operation of the NCWR is water storage for stream flow augmentation to address depletion of surface water flow in the affected watersheds associated with consumptive use of groundwater during operations (mine dewatering). Water stored in the NCWR would be used for mitigation of residual depletion in surface waters during operations and for approximately 20 years after the end of mine dewatering (Tintina Montana, Inc. 2018b). A high-flow water rights application package was submitted to the DNRC on September 7, 2018. The Proponent proposes to fill the NCWR using a wet well with the point of diversion located approximately 60 feet west of the private road in the hay meadow adjacent to Sheep Creek (NW ¼, SE ¼, NW ¼, Section 30, Township 12N, Range 07E depicted on **Figure 2-1**). Water from the wet well would be pumped to the NCWR during high-flow conditions from May through July, and only when flow in Sheep Creek exceeds 84 cfs, which is equal to the total flow of the appropriated water rights (including instream flow reservations) on Sheep Creek downstream of the diversion (where the wet well would operate). Water would be diverted at a maximum rate of 7.5 cfs during the high-flow period with a maximum total annual volume of

291.9 acre-feet. Water from the NCWR would then be available for release to affected watersheds (e.g., Coon Creek watershed; see subsection below) during the non-irrigation portion of the year to offset impacts on base flow due to groundwater drawdown associated with mine dewatering. Additionally, seepage from the NCWR is intended to offset a portion of the mine's consumptive groundwater use. As the NCWR would be used for transfer of water between Sheep Creek and other streams, discharges from the NCWR would not require coverage under an MPDES permit (ARM 17.30.1310(1)(g) and 40 CFR 122.3(i)).The measures spelled out in the new high season flow surface water beneficial use permit and six change applications would be used to mitigate potential adverse impacts from the consumptive use of groundwater in the mining and milling process and to mitigate potential indirect impacts to wetlands.

Potential impacts due to the diversion of stream flow to fill the NCWR would be nominal, as the majority of the diversion would occur under a new water right limited to May through July and only when stream flow is in excess of all existing water rights and instream flow requirements (84 cfs). Any diversions during other months would be based on using existing leased water rights along Sheep Creek that are currently being put to beneficial use (pending review and approval by the DNRC). Water diversion would be limited to the irrigation period of the year when water is available and leased water rights permit water withdrawal.

Dewatering Associated with Underground Mine Operations

Drawdown caused by dewatering (especially in the upper HSUs) would capture water that would otherwise ultimately report to surface water. This capture would result in decreasing the base flow and impacts in downgradient surface water resources. As described in Section 3.4.3.2, Proposed Action in Groundwater Hydrology, model simulations show that the greatest rate of mine dewatering drawing from the shallow groundwater hydrostratigraphic units (groundwater in shallow bedrock and in the alluvium) would occur in Year 4 and would correspond to the initial mining stage when the model predicts the highest inflow to the mine workings. As **Figure 3.4-10** shows, the 10-foot drawdown contour would extend into the Black Butte Creek watershed, and to the north close to Coon Creek. The maximum model-computed drawdown of the water table is approximately 290 feet in model layer 1. However, the 10-foot drawdown contour only extends into a small portion of the Sheep Creek alluvial groundwater system along the margin of Sheep Creek Meadows between the upland bedrock area and Coon Creek (Hydrometrics, Inc. 2016b).

The predictive model simulations estimated the following impacts of mine dewatering on base flow in the nearby creeks:

- Moose Creek (shown on **Figure 3.5-2** north of SW-1): Model simulations show no measurable change in stream flow in Moose Creek from mine dewatering.
- Black Butte Creek (shown on **Figure 3.5-2** southwest of SW-1): The estimated steady state base flow at the mouth of Black Butte Creek ranges from 2.6 to 3.2 cfs. The model simulations show a decrease of approximately 0.1 cfs (i.e., 3 to 4 percent of steady state base flow) in Black Butte Creek. The decrease starts to occur in Year 2 and reaches its peak in Year 4.

- Coon Creek (shown at the center of **Figure 3.5-2**): The mine dewatering simulations show a reduction of 0.12 cfs in the lower reach of Coon Creek. The total reduction in Coon Creek is estimated to be approximately 70 percent of the steady state base flow observed in the stream (0.2 cfs at the confluence with Sheep Creek). Water from the NCWR would be pumped into the headwaters of Coon Creek to augment flows within 15 percent of the average monthly flow (Hydrometrics, Inc. 2018c). Additionally, Coon Creek is often fully diverted during the irrigation season and frozen during the winter months. The Proponent has an agreement with the water right holder for Coon Creek to utilize the water right if necessary (change in water use would be dependent on approval by the DNRC). Based on these factors, and pending the approval by the DNRC, the reduction in flow to Coon Creek itself would not have a substantive impact on water resources in the area.
- Sheep Creek: The Sheep Creek watershed upstream of SW-1 has the highest potential to incur dewatering impacts, as it is the closest to the Project of any of the streams except Coon Creek. Sheep Creek has an estimated average base flow of 15.3 cfs. Model simulations at the end of mining show a decrease in the groundwater flow to Sheep Creek from the model domain of 0.35 cfs (157 gpm). The simulated depletion is approximately 2 percent of the total base flow in Sheep Creek at this location upstream of SW-1. Predicted depletion of 0.35 cfs (157 gpm) is less than the quantity of water that would be returned to Sheep Creek alluvium through the UIG, which would be an average of 530 gpm from the WTP (from October through June). When the UIG is not likely to be in operation (July through September), the decrease in stream flow would be less than the limit established in non-degradation rules. Under the rare 7Q10 low flow conditions, Sheep Creek flow is calculated to be 5.67 cfs (2,545 gpm). In those conditions, non-degradation rules limit a decrease in flow to less than 255 gpm. The predicted decrease in flow (157 gpm) does not account for additions to base flow from seepage from the NCWR. If necessary to maintain flow in Sheep Creek, the Proponent may also discharge water diverted to the NCWR from Sheep Creek during high flow conditions back to Sheep Creek via the wet well during other months.

Simulated stream depletions resulting from groundwater drawdown during mine dewatering for all streams in the assessment area, with the exception of Coon Creek, are within 10 percent of the measured base flows and, therefore, are expected to be nominal (Tintina 2017). For Coon Creek, a reduction of approximately 70 percent is estimated. To mitigate this reduction in Coon Creek flow, water would be pumped into the headwaters to maintain flows within 15 percent of the average monthly flow, and pending approval by the DNRC, an agreement with the water right holder for Coon Creek to obtain the water right would be utilized. As required in closed basins by the DNRC, the water rights mitigation plan would offset all the stream depletion in Sheep Creek (and Black Butte Creek if necessary) by mitigating flows via groundwater at a rate equal to the consumptive use of the Project (Tintina 2017).

Operation of the Underground Infiltration Gallery

Contributions of treated water back to the groundwater system would have a secondary impact on surface water. Water not used in the milling or mining process would be treated and discharged back to the groundwater system through an alluvial UIG. The alluvial UIG would be

located in non-wetland areas beneath the floodplain of Sheep Creek southwest of Strawberry Butte. The capacity and designed usage of the UIG is detailed in Section 3.4.3.2.

It is unlikely that operating the UIG would result in any negative secondary impacts on surface water quantity. Instead, it would partially compensate for the potential loss of base flow in Sheep Creek.

Impact Assessment

The combined impacts on surface water quantity based on the Proposed Action outlined in the Project description of this document are expected to be minor:

- Minimal surface disturbance would result in insignificant impacts on surface runoff.
- Diversion of water to the NCWR, other than during peak spring runoff (Sheep Creek flow in excess of 84 cfs), falls within existing leased water rights (pending review and approval of the DNRC).
- Secondary impacts on base flow of Sheep Creek as a result of mine dewatering and disposal of treated water to the UIG are expected to be insignificant and to partially offset one another. A more significant impact upon base flow would be possible for Coon Creek, with the total reduction in Coon Creek estimated to be approximately 70 percent of the steady state base flow. Impacts to Coon Creek would be mitigated by pumping water from the NCWR into the headwaters of Coon Creek to augment flows within 15 percent of the average monthly flow (Hydrometrics, Inc. 2018c). Nominal impacts are expected for Black Butte Creek, with a predicted reduction of 3 to 4 percent of steady state base flow. The Proponent has proposed to DRNC that some water from the NCWR also be routed to Black Butte Creek to offset the predicted stream flow depletion. No other creeks are present within the area of a 10-foot drawdown of the water table, as computed by the groundwater model.

A summary of the Project's impact on surface water quantity is presented in **Table 3.5-4.**

Table 3.5-4
Project's Potential Consequences Regarding Surface Water Quantity

Project Phases	Project Facilities/Activities	Notes
Mine Construction (Phases I and II; Project Years 1–4)	Surface disturbance affecting runoff	Surface disturbance is less than 1% of local watershed area. BMPs and the relatively small percentage of the total area (<1%) of stream and wetland features would be impacted through surface disturbance during construction.
	Diversion of stream flow to the NCWR	Based on existing leased water rights along Sheep Creek (pending review and approval by the DNRC).
	Mine dewatering	Simulated base flow depletion for all streams except Coon Creek is less than 10% and therefore is expected to be nominal. Coon Creek base flow reduction would be offset with water from the NCWR and through an agreement with the water rights holder to utilize the water rights (pending approval with the DNRC).
	Underground infiltration gallery	Partially compensates for the potential loss of base flow in Sheep Creek.
Mine Production (Phase III; Project Years 5–15)	Surface disturbance affecting runoff	Surface disturbance is less than 1% of local watershed area.
	Diversion of stream flow to the NCWR	Based on existing leased water rights along Sheep Creek.
	Mine dewatering	Simulated base flow depletion is less than 10% and therefore is expected to be nominal.
	Underground infiltration gallery	Partially compensates for the potential loss of base flow in Sheep Creek.
Post-Mine Period (Mine Closure and Post-Closure; Phase IV)	Surface disturbance affecting runoff	Surface disturbance is less than 1% of local watershed area.
	Diversion of stream flow to the NCWR	Based on existing leased water rights along Sheep Creek and a new water right limited to high flow conditions. The NCWR would be used for mitigation of residual depletion in surface waters for approximately 20 years after the end of mine dewatering.
	Mine dewatering	Base flow depletion is expected to cease within 2 years after dewatering stops. Where required, base flow reduction would be offset with water from the NCWR. The NCWR would be used for mitigation of residual depletion in surface waters for approximately 20 years after the end of mine dewatering.
	Underground infiltration gallery	No discharge to UIG after underground mine is closed and water treatment no longer necessary.

BMP = best management practice; DNRC = Montana Department of Natural Resources and Conservation; NCWR = Non-Contact Water Reservoir; UIG = Underground Infiltration Gallery

Smith River Assessment

The Smith River is located approximately 19 river miles downstream of the Project and is the receiving waters for Sheep Creek. Two active USGS gaging stations (USGS 06076690 and 06077200) are located upstream and downstream of the confluence with Sheep Creek. Average monthly flows at the upstream station (06076690) range from 18 to 3,200 cfs, and downstream of Sheep Creek (06077200), they range from 30 to 3,800 cfs (Hydrometrics, Inc. 2017a). The percentage of flow that Sheep Creek contributes to the Smith River cannot be directly quantified using the two USGS stations, as another tributary discharges between them (Eagle Creek). An inactive USGS station 06077000 (data from 1941 to 1972) on Sheep Creek upstream of the Project reported monthly average flows ranging from 9 to 115 cfs, which provides an approximation of the flow in Sheep Creek near the Project relative to the Smith River upstream of the confluence (from 30 percent during base flow periods to 4 percent during high-flow periods). Several tributaries merge with Sheep Creek downstream from the Project site, before its confluence with the Smith River (e.g., Coon Creek, Moose Creek, Indian Creek, Cameron Creek, Calf Creek, and Black Butte Creek).

The contributions of Sheep Creek to the Smith River provide the context to understand how impacts of the Proposed Action may translate downstream. As discussed in the previous section, based on the Proposed Action description, impacts on surface water quantity in Sheep Creek are expected to be minor, and therefore potential impacts on water quantity in the Smith River would be insignificant. The Smith River is included in DEQ's 303(d) list of impaired streams for flow regime modification due to agricultural irrigation, from the North and South Forks to the mouth at the Missouri River. Those activities which impact surface water quantity are not associated with the Project and are likely to continue in the future.

Agency Modified Alternative

The modifications identified in the AMA would result in impacts similar to those described for the Proposed Action. Modifications to the Proposed Action include an additional backfill of mine workings component. Additional backfill of the mine workings with low hydraulic conductivity material would help prevent air and groundwater flow within certain mine workings. Hydraulic simulations in the predictive groundwater models showed that if grouting of the declines was implemented (Proposed Action) there would not be any reduction in the impacts to steady state base flow in the larger watersheds and the depletion of base flow in Coon Creek would be reduced by only 4 gpm through reducing drawdown in the alluvium. Similarly, the additional backfill of mine workings would be expected to have a positive but very minimal impact on base flow reduction.

Smith River Assessment

The impacts of the AMA on water quantity in the Smith River would be the same as described for the Proposed Action. As described previously based on the Proposed Action description, impacts on surface water quantity in Sheep Creek are expected to be minor, and therefore potential impacts on water quantity in the Smith River would be negligible.