OTTER CREEK MINE
EXHIBIT 314A: PROTECTION OF THE HYDROLOGIC BALANCE

1.0 Introduction

This exhibit addresses the requirements of ARM 17.24.314(1)(a) to (c) and (2)(a) to (c). The requirements of applicable performance standards contained in ARM 17.24.631, 633, 638, 641, 643, 644, 648 and 651 are also addressed.

2.0 Overview

The mining and reclamation plan includes measures to accomplish the following:

- Protect the quality of surface and ground water systems, within both the mine plan area and adjacent areas, from adverse effects of mine operations.
- Protect the quantity of surface and ground water within both the proposed mine plan area and adjacent areas from adverse effects of mine operations.
- Protect the rights of present users of surface and ground water through measures to protect surface and ground water quality and quantity, and contingency plans to provide alternate sources of water if necessary pursuant to ARM 17.24.648.
- Control of surface and ground water drainage into, through and out of the mine plan area.
- Treat surface and ground water drainage from the area to be disturbed by the mine operations, when required to meet quantitative limits on pollutants in discharges subject to ARM 17.24.633 or other applicable state or federal laws.
- Restore the approximate recharge capacity of the mine plan area in accordance with ARM 17.24.644.

3.0 Mitigating Measures

The mining and reclamation plan incorporates measures to protect surface and ground water quantity and quality. For information on the hydrologic system please refer to Baseline Report 304E – Hydrology. Probable Hydrologic Consequences are addressed in Exhibit 314C, and Hydrologic Monitoring is described in Exhibit 314B.

3.1 Operational Surface Water Drainage Control

During mine operation, the surface water drainage system is designed to confine surface runoff to the mine area with zero discharge except in response to extraordinary runoff events. Any water discharges from the mine site will be routed through a permitted MPDES discharge point. Please refer to Map 11 – Operational Drainage Control. Drainage control design and implementation is described in detail in Exhibit 315A – Ponds and Embankments. The drainage plan incorporates the following elements.

- During initial road and facilities construction, best management practices will be employed to control sediment transport by storm water. Please refer to Exhibit 321A – Transportation Facilities.
- Surface water runoff from the area affected by mining will be controlled using excavated ponds rather than dams to allow flexibility in sizing and avoid the risk of structural failure during extreme runoff events. Excavated Ponds have the designation EP on Map 8 – Mine Plan and Map 11 – Operational Drainage Control, and are identified by watershed number.
- The plan for operational drainage control is sequential and complex, and is described in detail in Exhibit 315A – Ponds and Embankments. In general, runoff from facilities and initial mining disturbance will be captured by excavated ponds designed to contain runoff from a 10-year, 24-hour event. Runoff from spoils will be contained in ponds established in backfilled spoils with 100-year, 24-hour capacity. Because the "worst case" basis for design of these ponds is final pit closure and re-establishment of drainage, during the early years of mining they will be greatly over-designed and will serve primarily to contain pit dewatering.
- MPDES outfalls are shown on Map 11 – Operational Drainage Control. Outfalls will be numbered according to the MPDES permit when it is issued. All discharges will meet effluent limitations specified by the MPDES permit. Discharges will be infrequent. Dry weather discharges are not anticipated because pit water will be contained within the mine workings. Discharges, if they occur, will result from infrequent extraordinary rainfall or snow melt runoff events.

- During the reclamation phase, ponds will be reduced in size to serve as sediment traps to meet western alkaline coal mining sediment control standards, or as permanent ponds for wildlife habitat enhancement and wetlands mitigation.

3.2 Operational Ground Water Management

The mine plan incorporates the following measures for protection of ground water quality and quantity.

- The Knobloch coal subcrops along upstream portions of the valleys of Otter Creek and Threemile Creek adjacent to Tract 2, and coal remains beneath the alluvium in both valley bottoms. This coal is partially eroded and likely oxidized, and will be left in place, thus preserving the integrity of the alluvial aquifer.
- A barrier of unmined coal will be left along the alluvial subcrop. This barrier will moderate backflow of ground water from the alluvium into the box cut, and eventually, re-establish to approximate pre-mine conditions recharge from backfilled spoils to the alluvium.
- The Knobloch coal is burned along the lower portions of Otter Creek and Threemile Creek on Tract 2, leaving highly fractured clinker formed by the baking and fusing of overburden rock from the heat of the burning coal. The clinker is in contact with the alluvium and is a significant reservoir of ground water. A barrier of unmined coal will be left along the burn line to moderate backflow of ground water from the clinker into the box cut, and eventually, re-establish to approximate pre-mine conditions recharge from backfilled spoils to the clinker.
- When the box cut is mined, reversal of the gradient from the adjacent alluvium through the coal barrier to the pit will result in a temporary decline in the alluvial water level. Back-hauling of spoils in the box cut to the low wall after coal removal to construct the Main Haul Road will minimize the magnitude and duration of this effect by sealing the coal face, and facilitate management of groundwater in the pit by minimizing inflow.
- Pit inflow water will be managed internally to avoid discharge to Otter Creek:
    - During initial box cut development, pit inflow water will be pumped to an excavated pond in the mine plan footprint.

- As the box cut is developed, water will be pumped or routed to in-pit sumps.
- As the dragline pit advances, pit water will be routed via ramp road ditches to box cut ponds established in backfilled spoils.

- Water stored in box cut backfill ponds will be utilized for dust control on haul roads.

3.3 Post-Mining Hydrologic Balance

The post-mining drainage plan is shown on Map 14. During pit closure and final reclamation, the drainage pattern will be re-established according to the post-mining topography (Map 12). Ponds will be reduced in size to serve as sediment traps in order to meet sediment standards under the Western Alkaline Coal Mine Subcategory, or to serve as permanent ponds for wildlife habitat enhancement and wetlands replacement. Runoff and sediment transport will approximate pre-mining conditions.

Construction of the post-mining topography and placement of soil will re-establish soil conditions similar to pre-mining and promote similar infiltration and vertical recharge rates. Lateral recharge of backfilled spoils will occur initially from the Otter Creek alluvium and clinker on the west, and after final pit closure, from the Knobloch coal on the east until the approximate pre-mining gradient is re-established. Recharge from the spoil to the alluvium will approximate pre-mining rates due to the barrier of unmined coal left in place.

4.0 ARM 17.24.631 General Hydrology Requirements

(1) The mining and reclamation plan has been developed and will be conducted to minimize disturbance to the prevailing hydrologic balance and to prevent material damage to the prevailing hydrologic balance outside the permit area.

(2) Changes in water quality and quantity, in the depth to ground water, and in the location of surface water drainage channels will be minimized so that the post-mining land use of the disturbed land is not adversely affected and applicable federal and state statutes and regulations are not violated.

(3)(a) Operations will be conducted so as to minimize water pollution and will, where necessary, use treatment methods to mitigate water pollution. The mining and reclamation plan emphasizes

mining and reclamation practices that will prevent or minimize water pollution. Clean water diversions of drainages will be used in preference to the use of water treatment facilities unless precluded by topographic constraints.

(b) Practices to control and minimize pollution include stabilizing disturbed areas through land shaping, diverting runoff where feasible, minimization of disturbed area, prompt revegetation, and regulating channel velocity of water through drainage channel design and construction. Mulching is not planned but may be used in areas of high erosion potential. Selectively placing and sealing acid-forming and toxic-forming materials, and selectively placing waste materials in backfill areas are not planned because acid- and toxic-forming materials are not present.

(4) If pollution can be controlled only by treatment, OCC will operate and maintain the necessary water treatment facilities for as long as treatment is required. The only anticipated treatment is detention for sediment control.

5.0 ARM 17.24.633 Water Quality Performance Standards

(1) All surface drainage from the disturbed area, including disturbed areas that have been graded, seeded, or planted, will be treated by the BTCA before leaving the permit area. BTCA is use of sediment ponds. Additional BTCA practices will be implemented if required after commencement of operations if conditions arise that were not anticipated at the time of the permit application.

(2) Sediment control through BTCA practices will be maintained within the disturbed area until the disturbed area has been restored, the revegetation requirements of ARM 17.24.711, 17.24.713, 17.24.714, 17.24.716 through 17.24.718, 17.24.721, 17.24.723 through 17.24.726, and 17.24.731 have been met, the area meets state and federal requirements for the receiving stream, and evidence is provided that demonstrates that the drainage basin has been stabilized consistent with the approved post-mining land use. At the conclusion of mining reclamation, sediment ponds may be replaced with other best management practices (BMP's) through conversion of discharge points to sediment standards for the Western Alkaline Coal Mining Subcategory.

(3) All sediment control will be constructed in accordance with ARM 17.24.638 and 17.24.639 in approved locations before any mining operations begin in the drainage area

(4) All discharges which include water from areas disturbed by mining operations will be in compliance with all federal and state laws and regulations and applicable effluent limitations.

(5) Sediment ponds will be designed and maintained to contain runoff and sediment from a 10-year, 24-hour or greater precipitation event.

6.0 ARM 17.24.638 Sediment Control Measures

(1) Appropriate sediment control measures will be designed, constructed, and maintained using the BTCA to:

(a) prevent, to the extent possible, additional contributions of sediment to streamflow or to runoff outside the permit area;

(b) meet the more stringent of applicable state or federal effluent limitations; and

(c) minimize erosion to the extent possible.

(2) Sediment control measures will be implemented within or adjacent to the disturbed area. The sedimentation storage capacity of practices in and downstream from the disturbed area will reflect the degree to which successful mining and reclamation techniques are applied to reduce erosion and control sediment. Sediment control measures consist of the utilization of proper mining and reclamation methods and sediment control practices, singly or in combination. Sediment control methods to be utilized include but are not limited to:

(a) disturbing the smallest practicable area at any one time during the mining operation through progressive backfilling, grading, and prompt revegetation in accordance with ARM 17.24.711, 17.24.713, 17.24.714, 17.24.716 through 17.24.721, and 17.24.723 through 17.24.726;

(b) stabilizing backfill material to promote a reduction in the rate and volume of runoff, in accordance with the requirements of subchapter 5;

(c) retaining sediment within disturbed areas using sediment traps and other appropriate means;

(d) diverting runoff away from disturbed areas;

(e) diverting runoff by using protected channels or pipes through disturbed areas to eliminate additional erosion;

(f) using straw dikes, riprap, check dams, mulches, vegetative sediment filters, dugout ponds, and other measures that reduce overland flow velocity, reduce runoff volume, or trap sediment; and

(g) treating with chemicals.

7.0 ARM 17.24.641 Acid- And Toxic-Forming Spoils

Analysis of overburden (Baseline Report 304H) did not identify any acid- or toxic-forming materials. If encountered during the mining and reclamation process, drainage from acid- and toxic-forming spoil into ground and surface water will be avoided by:

(1) identifying, burying, and treating whenever necessary, spoil that may be detrimental to vegetation establishment or may adversely affect water quality if not treated or buried;

(2) preventing water from coming into contact with acid-forming or toxic-forming spoil in accordance with ARM 17.24.501(3), 17.24.504, 17.24.507, and other measures required by the Montana Department of Environmental Quality (MDEQ); and

(3) burying or otherwise treating all acid-forming or toxic-forming spoil within 30 days after it is first exposed on the mine site, or within a lesser period required by MDEQ. Temporary storage of the spoil will be proposed to MDEQ if burial or treatment within 30 days is not feasible and will not result in any material risk of water pollution or other prohibited effect. Storage would be limited to the period until burial or treatment first becomes feasible. Acid-forming or toxic-forming spoil to be stored will be placed on impermeable material and protected from erosion and contact with surface water.

8.0 ARM 17.24.643 Ground Water Protection

(1) Mining will be conducted to control the effects of drainage from pits, cuts, and other mining activities and disturbances. Based on overburden analysis, acid, toxic or otherwise harmful mine drainage waters are not anticipated. If such waters are encountered, OCC will prevent or control discharge into ground water flow systems so that adverse impacts on ground water flow systems and on approved post-mining land uses are prevented.

(2) Backfilled materials will be placed to minimize adverse effects on ground water flow and quality, to minimize off-site effects, and to support the approved post-mining land use.

Hydrologic Monitoring (Exhibit 314B) will include wells completed in graded spoils when sufficient spoil area is available.

9.0 ARM 17.24.644 Protection of Ground Water Recharge

(1) The disturbed area will be reclaimed to restore the approximate premining recharge capacity through restoration of the capability of the reclaimed areas as a whole to transmit water to the ground water system. This will be done by backfilling the pit to place graded spoils in contact with sources of lateral recharge, constructing the reclaimed landscape to approximate original contour and salvaging and redistributing surface soils in the reclamation process to ensure a similar rate of vertical recharge. The recharge capacity will be restored to support the approved post-mining land use, minimize disturbances to the prevailing hydrologic balance in the mine plan area and adjacent areas, and provide a rate of recharge that approximates the premining recharge rate. Hydrologic monitoring (Exhibit 314B) will ensure operations conform to this requirement.

(2) OCC will collect data and conduct studies as requested by MDEQ to determine whether the recharge capacity of the mined lands can be restored to the approximate premining recharge capacity.

10.0 ARM 17.24.648 Water Rights and Replacement

(1) OCC will replace the water supply of any owner of interest in real property who obtains all or part of his or her supply of water for domestic, agricultural, industrial, or other legitimate use from surface or underground source if such supply has been affected by contamination, diminution, or interruption proximately resulting from operation of Otter Creek Mine.

11.0 ARM 17.24.651 Stream Channel Disturbances and Buffer Zones

(1) Otter Creek is a perennial stream and its tributary Threemile Creek is an intermittent stream. No land within 100 feet of either stream will be disturbed by mining operations, nor will the streams be disturbed, except where transportation facilities, as approved by MDEQ, cross the streams.,.

(a) Where stream crossings occur the original stream function will be restored in accordance with ARM 17.24.634 and 17.24.751; and

(b) during and after the mining, the water quantity and quality and other environmental resources of the stream and the lands within 100 feet of the stream will not be adversely affected.

(2) Any area not to be disturbed will be designated a buffer zone and marked as specified in ARM 17.24.524.

(3) Biological communities present in Otter Creek and its tributaries in the vicinity of Tract 2 are described in Baseline Report 304K – Fish and Wildlife.