

STATEMENT OF BASIS

KENNECOTT UTAH COPPER, LLC
GROUND WATER DISCHARGE PERMIT RENEWAL
LARGE BINGHAM RESERVOIR SYSTEM
PERMIT NO. UGW350006

Introduction

The Division of Water Quality (DWQ) under the authority of the Utah Ground Water Quality Protection Rules¹(Ground Water Rules) issues ground water discharge permits to facilities which have a potential to discharge contaminants to ground water². As defined by the Ground Water Rules, such facilities include mining operations.³ The Ground Water Rules are based on an anti-degradation strategy for ground water protection as opposed to non-degradation; therefore, discharge of contaminants to ground water may be allowed provided that current and future beneficial uses of the ground water are not impaired and the other requirements of Rule 317-6-6.4.A are met.⁴ Following this strategy, ground water is divided into classes based on its quality⁵; and higher-quality ground water is given greater protection⁶ due to the greater potential for beneficial uses. DWQ has developed permit conditions consistent with R317-6 and appropriate to the nature of the mined materials, facility operations, maintenance, best available technology⁷ (BAT) and the hydrogeologic and climatic conditions of the site, to ensure that the operation would not contaminate ground water.

Basis for Permit Issuance

Under Rule 317-6-6.4A, DWQ may issue a ground water discharge permit if:

- 1) The applicant demonstrates that the applicable class TDS limits, ground water quality standards protection levels and permit limits established under R317-6-6.4E will be met;
- 2) The monitoring plan, sampling and reporting requirements are adequate to determine compliance with applicable requirements;
- 3) The applicant is using best available technology to minimize the discharge of any pollutant; and

1 Utah Admin. Code Rule 317-6

2 https://deq.utah.gov/ProgramsServices/programs/water/groundwater/docs/2008/08Aug/GWQP_PermitInfo.pdf

3 Utah Admin Code Rule 317-6-6.1A

4 Preamble to the Ground Water Quality Protection Regulations of the State of Utah, sec. 2.1, August, 1989

5 Utah Admin. Code Rule 317-6-3

6 Utah Admin. Code Rule 317-6-4

7 Utah Admin. Code Rule 317-6-1(1.3)

- 4) There is no impairment of present and future beneficial uses of ground water.

Purpose

This Statement of Basis (SOB) is for the renewal of Kennecott Utah Copper, LLC (Kennecott) Ground Water Discharge Permit (UGW350006) for the Large Bingham Reservoir System which is located 18 miles southwest of Salt Lake City adjacent to Kennecott's Bingham Canyon Mine operations. The reservoirs are approximately 1/4-mile southeast of Copperton Utah, in the northeast quarter of section 17 in Township 3 South, Range 2 West (SLBM).

Large Reservoir System

The Large Reservoir system, beginning at the upstream end, consists of:

- a) Desilting Basin (108 acre-feet capacity)
- b) Zone 1 (612 acre-feet capacity)
- c) Zone 2 (1,100 acre-feet capacity)

Desilting Basin

The Desilting Basin is located immediately upstream from Zone 1 and consists of three chambers which are used primarily to remove silt and debris from storm water flow out of Bingham Canyon, thus protecting the liner systems in other parts of the Large Reservoir from debris damage. The Desilting Basin is also used to de-water sludge removed from the zones in the Large Reservoir. Future ground water remediation projects may require more frequent use of this basin for sludge de-watering and drying depending on selected remediation technologies. The Desilting Basin's three chambers have the following liner systems.

Chamber 1 has the following seven-part liner system from bottom to top:

1. Compacted fill soil sub-base;
2. Four-inch thick road base;
3. 16 oz. geotextile felt layer,
4. 80-mil HDPE synthetic liner;
5. 16 oz. geotextile felt layer;
6. 12-inch thick road base; and
7. 8-inch thick concrete.

The sloping sides of the chamber are lined accordingly from bottom to top;

1. Compacted soil sub-base;
2. 12-inch thick compacted low permeability (1×10^{-6} cm/s) clay layer;
3. 8 oz. geotextile felt; and

4. 80-mil HDPE synthetic liner.

Chambers 2 and 3 are constructed in a manner similar to chamber No. 1 except that there is not an HDPE liner underlying the 8-inch thick concrete bottom.

Zones 1 and 2

Zones 1 and 2 are utilized for containment of the following waters: 1) storm water runoff from the mine; 2) acidic flows from the waste rock dumps; 3) water pumped from alluvium in Bingham Canyon, located up-gradient from the Large Reservoir; 4) flows associated with ground water remediation activities; and 5) other managed mine flows. Water in Zone 1 and Zone 2 is generally characterized by low pH (3.0-4.0) and elevated total dissolved solids (TDS > 20,000 mg/l). Zones 1 and 2 have identical leak detection and design specifications.

The liner system for Zones 1 and 2 consists of the following from bottom to top:

1. Twelve inches of low permeability (1×10^{-6} cm/s) clay liner;
2. A layer of geotextile;
3. A 60-mil HDPE liner;
4. A layer of drainage net material with a transmissivity of no less than 10 gallons per minute per foot;
5. An 80-mil HDPE liner.

Compliance Monitoring and Best Available Technology

The facility has been designed to employ a discharge control technology and a performance monitoring technology to prevent any significant measurable discharge from the facility. This approach is being used in lieu of monitoring wells, which are not feasible due to prior contamination of the ground water. If an effective ground water monitoring well network can be developed in the future and approved by the Director, this permit may be re-opened to incorporate appropriate ground water compliance monitoring and technology measurement provisions. Until such time as the basis for a water quality-based permit is developed to set numeric criteria for ground water compliance limits, the basis for this permit shall be through the performance of Best Available Technology.

Monitoring Requirements:

The Large Reservoir will be monitored as required in the following approved plans:

1. Large Reservoir Water Quality Sampling Plan;
2. Large Reservoir Leak Detection and Repair Plan; and
3. Desilting Basin Monitoring Plan.

Substantive Changes to Permit:

The Small Reservoir has been removed as a facility from the permit as part of this 5-year renewal. The Small Reservoir is located to the north of the Large Reservoir. When active leaching was occurring at the mine the Small Reservoir was used interchangeably with the Large Reservoirs to manage leachate and was a permitted facility within the permit. Active leaching was ceased at the mine in 2000 and piping connecting the Small Reservoir to potential acid rock drainage leachate was removed in 2009. The Small Reservoir is now used to store fresh water sourced from canals fed from the Jordan River, Clean Water Well LTG1139, or the Bingham Tunnel. The water is used as a surplus and/or makeup water for the Concentrator when there is a need for additional process water. The water quality of the surplus/ makeup water is consistent with the TDS requirements for Class II Drinking Water with concentrations less than 3,000 mg/L. Given that the water stored in the Small Reservoir is higher quality than background ground water, permitting this facility is no longer necessary. Should Kennecott seek to change the source, quality, or purpose of water stored in the Small Reservoir in the future, a written request for Director review and approval is required.

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