

STATEMENT OF BASIS
KENNECOTT UTAH COPPER, LLC.
COMBINED BINGHAM RESERVOIR **PERMIT RENEWAL**
PERMIT NO. UGW350006

FACILITY CONTACT:

Paula H. Doughty
Manager, Tailings & Water Services
Kennecott Utah Copper, LLC
4700 Daybreak Pkwy
South Jordan, Utah 84095
801-569-6000

FACILITY LOCATION: The Large and Small Bingham Reservoirs are located 18 miles southwest of Salt Lake City adjacent to Kennecott Utah Copper'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).

DESCRIPTION AND OPERATION OF FACILITY:

LARGE RESERVOIR SYSTEM

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

- a) Desilting Basin - 100 acre-feet capacity
- b) Zone 1 - 570 acre-feet capacity
- c) Zone 2 - 1,100 acre-feet capacity

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 (leached and non-leached); 3) water pumped from alluvium in Bingham Canyon up-gradient from the Large Reservoir; 4) flows associated with ground water remediation activities; 5) other managed mine flows; and may be used interchangeably with the Small Reservoir. 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).

This permit was modified on May 27, 1999 to allow Zones 1 and 2 of the Large Reservoir to store leach drain-down water during the cessation of active leaching. Zones 1 and 2 have identical leak detection and design specifications. Also water collected from the dumps following the drain down period will technically be called "meteoric" and is currently a permitted use. However, the chemical characteristics of the "meteoric" water will more closely resemble leach water for some time. 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.

The Desilting Basin, located immediately upstream from Zone 1, consists of three chambers and is 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 either the Small Reservoir or 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 lining systems.

Chamber 1 (from bottom to top): compacted fill soil sub-base, four-inch thick road base, 16 oz. geotextile felt layer, 80-mil HDPE synthetic liner, 16 oz. geotextile felt layer, 12 inch thick road base and 8-inch thick concrete. The sloping sides of the chamber are lined with compacted soil sub-base, 12-inch thick compacted low permeability (1×10^{-6} cm/s) clay layer, 8 oz. geotextile felt and 80-mil HDPE synthetic liner.

Chambers 2 and 3 are constructed in a manner similar to chamber No. 1 except that no HDPE liner underlies the 8-inch thick concrete bottom.

SMALL RESERVOIR

The Small Reservoir is located immediately to the north of the Large Reservoir and is used to store and manage either low pH water similar to the Large Reservoir or fresh water. Due to the planned molybdenum plant upgrades at the Copperton Concentrator, as described in a letter sent to the DWQ on October 5th, 2004, there is a need for additional process water capacity. The Small Reservoir may be used to store and manage acidic flows from the dumps or fresh water from the Lark Shaft and Bingham Tunnel, which will be used as process water in the molybdenum flotation plant. The fresh water has a circum-neutral pH and a TDS concentration less than 4,000 mg/L.

The Small Reservoir has a multiple liner configuration from bottom to top as follows:

- 1) Six-inch clay layer;
- 2) Six inches of sand with HDPE pipe leak detection layer (Lower Leak Detection LLD)
- 3) 12 inch clay liner;
- 4) Six inches of sand with HDPE pipe leak collection and removal layer (Pressure Relief System, PRS);
- 5) 60-Mil HDPE liner.

Both the PRS and LLD layers flow to separate sumps that are equipped with water level sensing devices that report flow out of these two layers. The flow sensing devices are incorporated into Kennecott's computerized process control network that is monitored 24 hours a day.

BASIS FOR PERMIT ISSUANCE

The basis for the issuance of the discharge permit as required under UAC R317-6-6.4, is to assure adequate ground water quality protection. 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 taken in lieu of monitoring wells, which are not feasible due to prior contamination of ground water. If an effective ground water monitoring well network can be developed in the future and approved by the Executive Secretary, 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 protection levels, 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) Water Quality Sampling Plan; 2) Leak Detection and Repair Program; and 3) Desilting Basin Monitoring Plan.

The Small Reservoir water quality will be monitored on a semi-annual basis when it contains either neutral or acidic water. In addition, fresh water sources (Lark Shaft and Bingham Tunnel) are measured at least twice per year and the analytical data may be included with the quarterly ground water reports. The PRS and LLD layers are alarmed with sensing devices that indicate when water accumulates in the sump. Continual monitoring of sump levels and sump pump operation from both the PRS and LLD must be reported.

DJH