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# STATEMENT OF BASIS

# GROUND WATER DISCHARGE PERMIT UGW350015

**Kennecott Utah Copper LLC**
Magna Process Water Reservoirs
Magna, Utah

**July 11th, 2025**

## Introduction

The Division of Water Quality (DWQ), under the authority of the Utah Ground Water Quality Protection Rules[1] (Ground Water Rules), issues ground water discharge permits to facilities that have the potential to discharge contaminants to ground water[2]. 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 Utah Administrative Code (UAC) 317-6-6.4.A are met[4]. Following this strategy, ground water is divided into classes based on its quality[5], and higher-quality ground water is given greater protection[6] due to its greater potential for beneficial uses.

The Director has developed permit conditions consistent with UAC R317-6 and appropriate to the nature of the mined materials, facility operations, maintenance, best available technology[7] (BAT), and the hydrogeologic and climatic conditions of the site, to ensure that the operation will not contaminate ground water.

## Basis for Permit Renewal

This Permit is being renewed in accordance with UAC R317-6-6.7. However, a permit may be terminated or a renewal denied if any one of the four items in UAC R317-6-6.8 applies:

A. Noncompliance by the permittee with any condition of the Permit where the permittee has failed to take appropriate action in a timely manner to remedy the Permit violation;

[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)

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B. The permittee's failure in the application or during the Permit approval process to disclose fully all significant relevant facts at any time;

C. A determination that the permitted facility endangers human health or the environment and can only be regulated to acceptable levels by plan modification or termination or

D. The permittee requests the termination of the Permit.

**Permit Changes and Modifications**

No new facilities will be regulated under this Permit. The Utah Copper Power Plant (UPP) has been removed from this permit application as a permitted facility and is in the process of being demolished. The demolition process of the UPP does not have the potential to discharge to ground water. The existing pipeline infrastructure from the UPP will be utilized to route construction wash water and any potential stormwater runoff associated with demolition activities to the existing tailings pipeline.

**Purpose**

Past permitting of this area included the North Concentrator facilities consisting of the Bonneville Crushing Mill, the Magna Flotation Mill and Filter Plant, and the Utah Copper Power Plant (UPP). These mills and filter plant facilities ceased operations in 2001, with reclamation completed in 2007. The UPP ceased operations in 2017 and is currently undergoing various stages of demolition. Currently in place is the Magna Process Water Reservoir, which includes containment and pumping facilities that route process water for Kennecott Utah Copper LLC ("Kennecott") operations.

The Magna Reservoir facility, located north of the former UPP facility, consists of two adjacent reservoirs. The reservoirs were constructed in 2011 to be primarily operated in series, with flow typically entering Reservoir No. 1, then flowing to Reservoir No. 2, and subsequently to Pump Stations 3, 3A, and 3B. However, each reservoir has an inlet, outlet, and overflow that can be isolated, allowing the reservoirs to be operated independently during periods of maintenance, modification, or repair. The reservoirs include an identical, double containment liner system as the seepage barrier:

- A primary liner comprised of an 80-mil High-Density Polyethylene (HDPE) geomembrane with microspikes for surface traction is located on top.
- A secondary liner comprised of a 60-mil HDPE geomembrane with drainage nubs is situated beneath the primary liner.

The volume of any leakage is monitored by electrical controls in leak detection manholes, which are linked to a programmable logic controller (PLC) located and monitored remotely at the Tailings Control Room.

**Hydrogeology**



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The Magna Process Water Reservoir facilities are located on the north flank of the Oquirrh Mountains. Immediately to the east and north of the site lie basin-fill sediments. Three aquifer systems exist in the vicinity of the Magna Process Water Reservoir: the Bedrock Aquifer system associated with the Oquirrh Mountains, the confined Principal Aquifer, and the unconfined Shallow Aquifer.

The Bedrock Aquifer beneath the facility is comprised of Paleozoic shale, quartzite, limestone, and dolomite. Recharge to the Bedrock Aquifer system is principally from precipitation in the mountains to the south. Ground water in the bedrock system discharges north of the Magna Process Water Reservoir facilities either directly to Adamson Spring or passes into the Principal Aquifer and into Adamson Spring or the Clarification Canal at or near Pump Station #1.

The Principal Aquifer is a confined system that includes a gravel zone and lacustrine deposits. The gravel zone was most likely derived from erosion of the mountains during an extensive low lake cycle. Many high-yield water supply wells near the Oquirrh Mountains are completed in the gravel zone of the Principal Aquifer. The lacustrine zone consists of clay, silt, and interbedded fine sand. The principal ground water flow direction for this aquifer is northerly.

The Shallow Aquifer system consists of interbedded lacustrine Bonneville clay, silt, and fine sand. The exact depth of this system varies but is approximately the upper 35 to 50 feet of saturated sediments. The potentiometric surface for the Shallow Aquifer system depicts lateral flow in a north and northeasterly direction with vertical ground water flow gradients predominantly in an upward direction for the majority of wells completed in the shallow system.

The Little Valley area encompasses the surface drainage from the decommissioned Bonneville Mill. Recharge from rain and snow that come in contact with the former ore storage area or other decommissioned operations associated with Bonneville facilities would enter the bedrock system beneath the Little Valley area.

**Ground Water Quality**

The water quality in the Bedrock, Principal, and Shallow Aquifers beneath and immediately adjacent to the Magna Reservoir facilities is generally a Class II water with total dissolved solids (TDS) values ranging from 1,000 mg/L in the southern area to nearly 2,000 mg/L in the northern area. Ground water concentrations of sulfate typically range from less than 100 mg/L up to 500 mg/l. Additionally, the seepage from the freshwater Utah-Salt Lake Canal (originating from the Jordan River) has an average sulfate concentration of approximately 400 mg/L. This seepage appears to influence the ground water quality in the area east of the permit boundary along the canal.

Concentrations of dissolved trace metals are relatively low. Cadmium, chromium, lead, mercury, and silver are near or below the minimum detection limit. Arsenic concentrations are generally in the 0.005 to 0.016 mg/L range, which is well below the ground water quality standard of 0.05 mg/L. Dissolved copper concentrations range from non-detect to 0.02 mg/L. Selenium

concentrations range from non-detect to 0.025 mg/L.

**Compliance Monitoring Program**

A semiannual compliance monitoring program is required by the permit. Compliance Limits have been established pursuant to UAC R317-6-6.4. The following parameters were selected for compliance monitoring based on their high concentrations in the process water compared to concentrations in shallow ground water:

- TDS
- Chloride
- Sulfate
- Alkalinity
- Calcium
- Magnesium
- Potassium
- Sodium
- Dissolved Metals (arsenic, boron, lead, barium, cadmium, chromium, copper, selenium, and zinc)

**Best Available Technology (BAT) and Facility Modifications**

Kennecott is in the process of demolishing the UPP BAT applicable to the management of the Magna Reservoirs and its associated conveyance systems.

**Compliance Schedule Items**

1. Within one year of permit issuance, Kennecott shall submit to the Director, for review and approval, a series of contour maps covering the site-wide facility area. The contour maps shall display the average concentrations of selenium, arsenic, chloride, and ground water elevations. The contour maps will include years 2010, 2015, 2020, and 2025, corresponding to previous permit renewal years, to track changes in water elevation and analyte concentrations over time to support future groundwater permit renewal applications.

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