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STATEMENT OF BASIS

GROUND WATER DISCHARGE PERMIT UGW350015

Rio Tinto Kennecott Copper
Magna Process Water Reservoir
Magna, Utah

June, 2015

Purpose

Past permitting of this area included the North Concentrator facilities consisting of the Bonneville Crushing Mill as well as the Magna Flotation Mill and Filter Plant. These facilities ceased operations in 2001 with reclamation completed in 2007. Currently in place are the Utah Power Plant (UPP) and Magna Process Water Reservoir, which include containment and pumping facilities that route process water for Rio Tinto Kennecott (RTKC) operations.

The Magna Reservoir facility, located north of the UPP facility, consists of two reservoirs located adjacent to each other. The reservoirs were constructed in 2011 to primarily be operated in series with flow typically first entering Reservoir No. 1, flowing to Reservoir No. 2, and then to Pump Stations 3, 3A, and 3B. However, each reservoir has an inlet, outlet, and overflow that can be isolated so that the reservoirs can 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 consisting of an 80-mil HDPE geomembrane with microspikes for surface traction is located on top.
- A secondary liner consisting of a 60-mil HDPE geomembrane with drainage nubs is located beneath the primary liner.

The volume of any leakage is monitored by electrical controls in leak detection manholes that are linked to a PLC located and monitored remotely at the Tailings Control Room.

The Utah Power Plant is a four unit 175 megawatt capacity plant operated with either coal or natural gas. Possible Modifications to the facility include replacing the Boiler Units 1, 2, and 3 with a new natural gas fired Combined Cycle Turbine (See Facility Modifications below). Unit 4 Boiler will remain operational for the identifiable future on either coal or natural gas.

The Utah Power Plant can supply up to 80-85% of the electrical power required for all RTKC facilities during the months of March through October.

Hydrogeology

The Magna Process Water Reservoir facilities are located on bedrock 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 on the mountains to the south. Ground water in the bedrock system flow path discharges to the north of the Power Plant and 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 which 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. Principal ground water flow direction for this aquifer is north to northwest.

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 northwesterly 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 events 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 TDS values that range from 1,000 mg/l in the southern area to near 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. In addition, the seepage from the fresh water Utah - Salt Lake Canal (Jordan River source) has an average sulfate concentration of approximately 400 mg/l. This appears to influence the ground water quality in the area along the canal that is east of the permit boundary.

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 but 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 following the specific rule of 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
- Boron
- Sulfate
- Alkalinity
- Calcium
- Magnesium
- Potassium
- Sodium
- Dissolved Metals

Best Available Technology (BAT) and Facility Modifications

Possible future modifications to the UPP include replacing the Boiler Units 1, 2, and 3 with a new natural gas fired Combined Cycle Turbine. The new turbine will require associated components which could be considered a Point Source Component or Permit-By-Rule component pursuant to the Permit UGW350015. To facilitate identification but not operational approval in Permit UGW350015, these components are listed as "FUTURE" in Table 2, 3, and 4, respectively,

RTKC is in the process of decommissioning the UPP Make-up Process Water storage cells (10 total). In place of the eastern half of the 10-cell system, a new water storage tank will be erected. Once construction completion of the new storage tank is achieved, then the western most half of the old storage cells will be demolished. The new water storage tank will be used for make-up process water for the UPP Cooling Towers and also for fire water emergencies.