

Kennecott North End Facilities with Ground Water Discharge Permits

UGW350008 Smelter

UGW350011 Tailings Impoundment

UGW350015 North Concentrator



UGW350011
Tailings Impoundment

NRDC
wetlands

UGW350008
Smelter

UGW350015
North Concentrator

Magna, UT

Magna

SMELTER UGW350008



Tailings Impoundment UGW350011



GSL

Right-of-Way canal

C-7 Ditch
outfall to GSL

Toe Ditch

North Impoundment
(active)

South Impoundment
(closed)

Clarification
Canal

Arthur
Step-back
Repository

Imagery Date: 6/17/2010 1997

40°45'03.72"N 112°07'19.63"W elev 4249 ft

Eye alt 32939 ft

Tailings Impoundment

Permitted disposal waste streams: (what goes in....)

- 1) Copper Tailings from the Copperton Concentrator;
- 2) Slag Tailings from the slag concentrator at the Smelter;
- 3) Power plant ash slurry;
- 4) Smelter process waters;
- 5) Wastewater effluent slurry from the Hydrometallurgical Plant at the Smelter;
- 6) Mine leach water and meteoric contact water that have been treated in the tailings pipeline;
- 7) Wastewater effluent from the Reverse Osmosis treatment of sulfate contaminated waters;
- 8) Neutralization of acid-mine contaminated waters;
- 9) Barneys Canyon pit dewatering and heap leach pad draindown waters;
- 10) Construction, maintenance and lunchroom trash;
- 11) Treated effluent from the sewage treatment plant; and
- 12) Other inflows that are approved by the Executive Secretary for this permit.

What comes out:

Water from the tailings slurry after sediments have settled out.

The water is collected via gravity into the toe drain, and is pumped to the clarification canal for additional de-silting, then to pump station #1.

From pump station #1 it is sent to the Magna Reservoir and on to Copperton for reuse.

Or

Discharged to the Great Salt Lake through UPDES outfalls if permit limits are met

NORTH CONCENTRATOR UGW350015



July 2011 modifications to UGW350015

- Kennecott is replacing the concrete Magna Reservoir (circa 1904) with two new reservoirs with upgraded technology: dual HDPE liners with leak detection components
- Add a description of the Best Available Technology (BAT) of the new Magna Reservoirs to the permit: *Appendix B Magna Reservoir Leak Detection and Water Quality Sampling Plan*
- Add compliance limits for boron to the list of parameters monitored by groundwater sampling. Boron detection in groundwater could provide an indication of power plant process water releases.



Old Magna Reservoir
Built in 1904



Replacement Magna
Reservoir

Groundwater Monitoring Parameters

(typical for North End permits)

- TDS
- Chloride
- Sulfate
- Dissolved Metals (As, Ba, Cd, Cr, Cu, Pb, Se, Zn)
- Major ions
- Field parameters (pH, conductivity, temperature)
- For Tailings Waste stream inflows
 - Synthetic Precipitation Leaching Procedure (SPLP - EPA SW846 Method 1312) and total metals analysis
 - Acid-base accounting to determine acidification potential of exposed tailings surfaces
 - Toe ditch water prior to discharge or reuse

Where are the hot spots?



Generalized Groundwater Contamination Limits for Selenium, Arsenic, and Sulfate, Individual



Generalized Limits of OU23 Groundwater Contamination in Bedrock, Principal, and

10+ year average Selenium concentration in shallow aquifer monitoring wells
units: mg/L
Groundwater standard: 0.05 mg/L



