Permit No. UT0000051

STATE OF UTAH
DIVISION OF WATER QUALITY
DEPARTMENT OF ENVIRONMENTAL QUALITY
SALT LAKE CITY, UTAH

AUTHORIZATION TO DISCHARGE UNDER THE
UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM
(UPDES)

In compliance with provisions of the Utah *Water Quality Act, Title 19, Chapter 5, Utah Code Annotated ("UCA") 1953, as amended* (the *"Act"*),

KENNECOTT UTAH COPPER LLC

is hereby authorized to discharge from its facility located near Magna and in western Salt Lake County, Utah, with the outfalls located at the following:

Outfall	Latitude	Longitude	To receiving waters named
002	40° 44'30"	112° 05'15"	C-7 Ditch
004	40° 44'06"	112° 11'49"	I-80 Culvert to Great Salt Lake
007	40° 46'15"	112° 07'00"	C-7 Ditch
008	40° 44'12"	112° 10'25"	Great Salt Lake
009	40° 32'07"	112° 11'39"	Pine Canyon Creek, Tooele County
010	40° 29'33"	112° 07'20"	Butterfield Creek
011	40° 42'52"	112° 06'57"	Riter-Utah Salt Lake Canals
012	40° 45'20"	112° 10'02"	Great Salt Lake
104	40° 43'27"	112°11'50"	Internal discharge, Hydrometallurgical Plant
SW3	40° 42' 02"	112° 06'38"	Little Valley Wash
SW4	40° 32'51"	112° 12'22"	Pine Canyon Creek, Tooele County

in accordance with discharge points, effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on February 01, 2017.

This permit and the authorization to discharge shall expire at midnight, January 31, 2022.

Signed the 26th day of January, 2017.

Kim Shelley
Acting Director

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I EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. Definitions

1. The "30-day (and monthly) average" is the arithmetic average of all samples collected during a consecutive 30-day period or calendar month, whichever is applicable. The calendar month shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms.

2. The "7-day (and weekly) average" is the arithmetic average of all samples collected during a consecutive 7-day period or calendar week, whichever is applicable. The 7-day and weekly averages are applicable only to those effluent characteristics for which there are 7-day average effluent limitations. The calendar week which begins on Sunday and ends on Saturday, shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms. Weekly averages shall be calculated for all calendar weeks with Saturdays in the month. If a calendar week overlaps two months (i.e., the Sunday is in one month and the Saturday in the following month), the weekly average calculated for that calendar week shall be included in the data for the month that contains the Saturday.

3. "Daily Maximum" ("Daily Max.") is the maximum value allowable in any single sample or instantaneous measurement.

4. "Composite samples" shall be flow proportioned. The composite sample shall, as a minimum, contain at least four (4) samples collected over the composite sample period. Unless otherwise specified, the time between the collection of the first sample and the last sample shall not be less than six (6) hours nor more than 24 hours. Acceptable methods for preparation of composite samples are as follows:

    a. Constant time interval between samples, sample volume proportional to flow rate at time of sampling;

    b. Constant time interval between samples, sample volume proportional to total flow (volume) since last sample. For the first sample, the flow rate at the time the sample was collected may be used;

    c. Constant sample volume, time interval between samples proportional to flow (i.e., sample taken every "X" gallons of flow); and,

    d. Continuous collection of sample, with sample collection rate proportional to flow rate.

5. A "grab" sample, for monitoring requirements, is defined as a single "dip and take" sample collected at a representative point in the discharge stream.

6. An "instantaneous" measurement, for monitoring requirements, is defined as a single reading, observation, or measurement.

7. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

8. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

9. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

10. "Director" means Director of the Utah Division of Water Quality.

11. "EPA" means the United States Environmental Protection Agency.

12. "Acute toxicity" occurs when 50 percent or more mortality is observed for either test species at any effluent concentration.

13. "Chronic toxicity" occurs when the survival, growth, or reproduction for the test species exposed to a specific percent effluent dilution is significantly less (at the 95 percent confidence level) than the survival, growth, or reproduction of the control specimens.

14. "Act" means the "*Utah Water Quality Act*".

15. "Best Management Practices" ("*BMPs*") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. *BMPs* also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

16. "*CWA*" means *The Federal Water Pollution Control Act*, as amended, by *The Clean Water Act of 1987*.

17. "Flow-weighted composite sample" means a composite sample consisting of a mixture of aliquots collected at a constant time interval, where the volume of each aliquot is proportional to the flow rate of the discharge.

18. "Illicit discharge" means any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a *UPDES* permit (other than the *UPDES* permit for discharges from the municipal separate storm sewer) and discharges from firefighting activities, fire hydrant flushings, potable water sources including waterline flushings, uncontaminated ground water (including dewatering ground water infiltration), foundation or footing drains where flows are not contaminated with process materials such as solvents, springs, riparian habitats, wetlands, irrigation water, exterior building wash down where there are no chemical or abrasive additives, pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred and where detergents are not used, and air conditioning condensate.

19. "Landfill" means an area of land or an excavation in which wastes are placed for permanent disposal, and which is not a land application unit, surface impoundment, injection well, or waste pile.

20. "Land application unit" means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for treatment or disposal.

21. "Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharges. This term does not include return flows from irrigated agriculture or agriculture storm water runoff.

22. "Runoff coefficient" means the fraction of total rainfall that will appear at a conveyance as runoff.

23. "Significant materials" includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under *Section 101(14)* of *CERCLA*; any chemical the facility is required to report pursuant to *EPCRA Section 313*; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

24. "Significant spills" includes, but is not limited to: releases of oil or hazardous substances in excess of reportable quantities under *Section 311* of the *Clean Water*

Act (see *40 CFR 110.10* and *40 CFR 117.21*) or *Section 102* of *CERCLA* (see *40 CFR 302.4*).

25. "Storm water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

26. "Time-weighted composite" means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.

27. "Waste pile" means any noncontainerized accumulation of solid, nonflowing waste that is used for treatment or storage.

28. "10-year, 24-hour precipitation event" means the maximum 24-hour precipitation event with a probable reoccurrence interval of once in 10 years. This information is available in *Weather Bureau Technical Paper No. 40*, May 1961 and *NOAA Atlas 2,* 1973 for the 11 Western States, and may be obtained from the National Climatic Center of the Environmental Data Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

29. "Section 313 water priority chemical" means a chemical or chemical categories that:

    a. Are listed at *40 CFR 372.65* pursuant to *Section 313* of the *Emergency Planning and Community Right-to-Know Act* (*EPCRA*) (also known as *Title III of the Superfund Amendments and Reauthorization Act* (*SARA*) of 1986);

    b. Are present at or above threshold levels at a facility subject to *EPCRA Section 313* reporting requirements; and

    c. Meet at least one of the following criteria:

        i. Are listed in *Appendix D* of *40 CFR Part 122* on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols) or Table V (certain toxic pollutants and hazardous substances);

        ii. Are listed as a hazardous substance pursuant to *Section 311(b)(2)(A)* of the *CWA* at *40 CFR 116.4*; or

        iii. Are pollutants for which EPA has published acute or chronic water quality criteria. See *Appendix III* of this permit. This appendix was revised based on final rulemaking EPA published in the *Federal Register* November 30, 1994.

B. **Description Of Discharge Points**

The authorization to discharge provided under this permit is limited to those outfalls specifically designated below as discharge locations and other storm water discharges (Part I.E.). Discharges at any location not authorized under a UPDES permit is a violation of the *Act* and may be subject to penalties under the *Act*. Knowingly discharging from an unauthorized location or failing to report an unauthorized discharge may be subject to criminal penalties as provided under the *Act*.

Discharge Points		
Outfall Number	**Location of Discharge Points**	**Receiving Waters**
002	Latitude 40° 44' 30" Longitude 112° 05' 15"	Tailings pond outfall to C-7 ditch
004	Latitude 40° 44' 06" Longitude 112° 11' 49"	I-80 Culvert to Great Salt Lake
007	Latitude 40°46'15" Longitude 112°07'00"	Toe Ditch Pond to C-7 ditch
008	Latitude 40°44'12" Longitude 112°10'25"	Artesian well water, refinery storm water to the Great Salt Lake
009	Latitude 40°32'07" Longitude 112°11'39"	Pine Canyon Tunnel, Tooele County
010	Latitude 40°29'33" Longitude 112°07'20"	Butterfield Tunnel to Butterfield Creek
011	Latitude 40°42'52" Longitude 112°06'57"	Adamson Springs to the Ritter-Utah Salt Lake Canals
012	Latitude 40° 45' 20" Longitude 112° 10' 02"	Tailings discharge to the Great Salt Lake
104	Latitude 40°43'27" Longitude 112°11'50"	Internal discharge from Hydrometallurgical Plant
SW3	Latitude 40°42' 02" Longitude 112°06'38"	Little Valley Wash
SW4	Latitude 40°32'51" Longitude 112°12'22"	Pine Canyon Creek, Tooele County

C. **Narrative Standard**

It shall be unlawful, and a violation of this permit, for the permittee to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste, or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures.

D. **Specific Limitations and Self-monitoring Requirements**

1. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from **Outfalls 002 and 007**. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 002 a/						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	50.0	NA	NA	Continuous	Recorder	MGD
TSS	20	30	NA	3 X Weekly	Composite	mg/L
Total As	0.181	0.378	NA	3 X Weekly	Composite	mg/L
Total Cd	0.00079	0.0097	NA	3 X Weekly	Composite	mg/L
Total Cu	0.036	0.057	NA	3 X Weekly	Composite	mg/L
Total Pb	0.0223	0.532	NA	3 X Weekly	Composite	mg/L
Total Hg	0.000013	0.0020	NA	3 X Weekly	Composite	mg/L
Total Zn	0.224	0.431	NA	3 X Weekly	Composite	mg/L
Total Se b/c/	0.012	NA	NA	Monthly	Grab	mg/L
Total Cyanide	0.0056	0.0241	NA	Monthly	Composite	mg/L
Total Dissolved Solids (TDS)	NA	NA	NA	Monthly	Composite	mg/L
Oil and Grease	NA	10	NA	d/	Grab	mg/L
pH	NA	9.0	6.5	3 X Weekly	Grab	SU

Effluent Limitation, Self-Monitoring and Reporting Requirements Outfall 007 a/						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	15.0	NA	NA	Continuous	Recorder	MGD
TSS	20	30	NA	3 X Weekly	Composite	mg/L
Total As	0.25	0.465	NA	3 X Weekly	Composite	mg/L
Total Cd	0.00089	0.0119	NA	3 X Weekly	Composite	mg/L
Total Cu	0.0492	0.0692	NA	3 X Weekly	Composite	mg/L
Total Pb	0.031	0.660	NA	3 X Weekly	Composite	mg/L
Total Hg	0.000015	0.002	NA	3 X Weekly	Composite	mg/L
Total Zn	0.224	0.50	NA	3 X Weekly	Composite	mg/L
Total Se b/c/	0.012	NA	NA	Monthly	Grab	mg/L
Total Cyanide	0.0065	0.0291	NA	Monthly	Composite	mg/L
Total Dissolved Solids (TDS)	NA	NA	NA	Monthly	Composite	mg/L
Oil and Grease	NA	10	NA	d/	Grab	mg/L
pH	NA	9.0	6.5	3 X Weekly	Grab	SU

There shall be no or floating solids or visible foam in other than trace amounts.

See Definitions, *Part I.A* for definition of terms.

N.A. - Not Applicable.

a/ Samples taken in compliance with the monitoring requirements specified above shall be taken at the outfall to the C-7 ditch prior to mixing with the receiving water.

b/ 0.012 mg/L is consistent with the requirements of the U.S. Army Corps of Engineers 404 Permit #199450301 and shall not be exceeded at the Lower Lee Creek location north of Interstate 80 during a discharge from outfalls 002 and 007.

c/ Selenium will be analyzed by EPA Method 200.8 or an alternative method approved by the State of Utah Bureau of Laboratory Improvement.

d/ Oil and grease will be sampled when sheen is observed.

2. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from **Outfall 004**. Discharges from outfall 004 are not

limited on flow, but will be monitored and reported if discharges occur. Such discharges shall be monitored quarterly by the permittee for the same parameters as specified in the permit for Outfall 008.

3. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from **Outfall 008.** The discharge is monitored quarterly for the same parameters as Outfall 012 except for cyanide and biomonitoring. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Limitation, Self-Monitoring and Reporting Requirements Outfall 008						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	5.5	NA	NA	Quarterly	Measured	MGD
TSS	20	30	NA	Quarterly	Grab	mg/L
Total As	0.25	0.50	NA	Quarterly	Grab	mg/L
Total Cd	0.05	0.10	NA	Quarterly	Grab	mg/L
Total Cu	0.15	0.30	NA	Quarterly	Grab	mg/L
Total Pb	0.30	0.60	NA	Quarterly	Grab	mg/L
Total Hg	0.001	0.002	NA	Quarterly	Grab	mg/L
Total Zn	0.224	0.50	NA	Quarterly	Grab	mg/L
Selenium	NA	0.054	NA	Quarterly	Grab	mg/L
Total Dissolved Solids (TDS)	NA	NA	NA	Quarterly	Grab	mg/L
Oil and Grease	NA	10	NA	a/	Grab	mg/L
pH	NA	9.0	6.5	Quarterly	Grab	SU

There shall be no floating solids or visible foam in other than trace amounts.

N.A. - Not Applicable.

a/ See Definitions, *Part I.A* for definition of terms

b/ Selenium will be analyzed by EPA Method 200.8 or an alternative method approved by the State of Utah Bureau of Laboratory Improvement.

c/ Oil and grease will be sampled when sheen is observed.

4. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from **Outfall 009**. Such discharges shall be limited and monitored by the permittee as specified:

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 009 a/						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	0.086	NA	NA	2 X Yearly	Measured	MGD
TSS	20	30	NA	2 X Yearly	Grab	mg/L
Total As	0.25	0.50	NA	2 X Yearly	Grab	mg/L
Total Cd	0.05	0.10	NA	2 X Yearly	Grab	mg/L
Total Cu	0.15	0.30	NA	2 X Yearly	Grab	mg/L
Total Pb	0.30	0.60	NA	2 X Yearly	Grab	mg/L
Total Hg	0.001	0.002	NA	2 X Yearly	Grab	mg/L
Total Zn	0.224	0.50	NA	2 X Yearly	Grab	mg/L
Selenium b/	0.012	NA	NA	2 X Yearly	Grab	mg/L
Total Dissolved Solids (TDS)	NA	NA	NA	2 X Yearly	Grab	mg/L
Oil and Grease	NA	10	NA	a/	Grab	mg/L
pH	NA	9.0	6.5	2 X Yearly	Grab	SU

See Definitions, *Part I.A* for definition of terms.

a/ Oil and grease will be sampled when sheen is observed.

b/ Selenium will be analyzed by EPA Method 200.8 or an alternative method approved by the State of Utah Bureau of Laboratory Improvement.

5. During the period beginning immediately and lasting through the duration of this permit, the permittee is authorized to discharge from **Outfall 010 (Butterfield Tunnel)**. The discharge shall be limited and monitored by the permittee as specified:

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 010						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	0.65	NA	NA	Quarterly	Measured	MGD
TSS	20	30	NA	Quarterly	Grab	mg/L
Total As	NA	0.10	NA	Quarterly	Grab	mg/L
Total Cd	0.0013	0.0066	NA	Quarterly	Grab	mg/L
Total Cu	NA	0.038	NA	Quarterly	Grab	mg/L
Total Fe	NA	1.09	NA	Quarterly	Grab	mg/L
Total Pb	0.023	0.100	NA	Quarterly	Grab	mg/L
Total Hg	0.00002 a/	0.00023	NA	Quarterly	Grab	mg/L
Total Zn	0.323	0.493	NA	Quarterly	Grab	mg/L
Selenium b/	0.005	0.0184	NA	Quarterly	Grab	mg/L
Total Dissolved Solids (TDS)	NA	1200	NA	Quarterly	Grab	mg/L
Oil and Grease	NA	10	NA	c/	Grab	mg/L
pH	NA	9.0	6.5	Quarterly	Grab	SU

See definitions Part I.A. for definition of terms.

a/ Kennecott will voluntarily analyze mercury using a low level mercury analysis.

b/ Selenium will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.

c/ Oil and grease will be sampled when sheen is observed.

6. During the period beginning immediately and lasting through the duration of this permit, the permittee is authorized to discharge from **Outfall 011 (Adamson Spring)**. The discharge shall be limited and monitored by the permittee as specified:

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 011						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow a/	3.9	NA	NA	Quarterly	Measured	MGD
TSS	20	30	NA	Quarterly	Grab	mg/L
Total As	NA	0.013	NA	Quarterly	Grab	mg/L
Total Cd	0.0013	0.010	NA	Quarterly	Grab	mg/L
Total Cu	0.102	0.119	NA	Quarterly	Grab	mg/L
Total Pb	0.0662	0.010	NA	Quarterly	Grab	mg/L
Total Zn	0.224	0.50	NA	Quarterly	Grab	mg/L
Selenium b/	0.0058	0.013	NA	Quarterly	Grab	mg/L
Oil and Grease	NA	10	NA	c/	Grab	mg/L
pH	NA	9.0	6.5	Quarterly	Grab	SU

See definitions Part I.A. for definition of terms.
NA – Not Applicable

a/ For intermittent discharges, the duration of the discharge shall be reported.

b/ Selenium will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.

c/ Oil and grease will be sampled when sheen is observed.

7. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from **Outfall 012.** Such discharges shall be limited and monitored by the permittee as specified:

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 012							
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Annual Max	Frequency	Sample Type	Units
Flow	NA	NA	NA	6468	Continuous	Recorder	MG b/
TSS	20	30	NA	NA	Daily	Composite	mg/L
Total As	0.25	0.50	NA	NA	Daily	Composite	mg/L
Total Cd	0.05	0.10	NA	NA	Daily	Composite	mg/L
Total Cu	0.15	0.30	NA	NA	Daily	Composite	mg/L
Total Pb	0.30	0.60	NA	NA	Daily	Composite	mg/L
Total Hg e/	0.001	0.002	NA	NA	Monthly	Grab	mg/L
Total Zn	0.224	0.50	NA	NA	Daily	Composite	mg/L
Total Se c/	NA	0.054	NA	NA	Daily	Composite	mg/L
Total Se, load	NA	NA	NA	900	Monthly	Calculated	Kg
Total Cyanide	0.1	0.2	NA	NA	Monthly	Composite	mg/L
Selenium	NA	NA	NA	NA	Annually	See Section I.D.10.	
TDS	NA	NA	NA	NA	Monthly	Composite	mg/L
Oil and Grease	NA	10	NA	NA	d/	Grab	mg/L
pH	NA	9.0	6.5	NA	Daily	Grab	SU
WET Acute Biomonitoring	NA	LC_{50} > 100% Effluent	NA	NA	Quarterly	Composite	NA
WET Chronic Biomonitoring	NA	$TU_c \leq 1.6$ /f	NA	NA	Quarterly	Composite	NA

There shall be no untreated sanitary wastewater discharged into the tailings impoundment.

There shall be no floating solids or visible foam in other than trace amounts.

N.A. - Not Applicable.

See Definitions, *Part I.A* for definition of terms.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the outfall to the Great Salt Lake prior to mixing with the receiving water.

a/ Annual Discharge will be limited annually to 6468 Million Gallons a year (19,850 acre feet/year).

b/ Million Gallons

c/ Selenium in effluent will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.

d/ Oil and grease will be sampled when sheen is observed.

e/ The mercury analytical method must be EPA Method 1631 used on grab samples collected from the tailings impoundment barge

f/ TUc is calculated by dividing the receiving water effluent concentration determined in accordance with R317-2-5 by the chronic test IC25. The TUc is an indicator and an exceedance is not used for determining compliance.

8. Effective immediately the permittee is authorized to discharge from **Outfall 104 (Hydrometallurgical plant)**. The discharge lbs/day shall be limited and monitored by the permittee as specified below:

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 104					
Parameter	Discharge Limitations a/		Monitoring Requirements		Units
	Maximum Monthly Average	Daily Maximum	Frequency	Sample Type	
Flow	NA	NA	Continuous	Recorder	MGD
TSS	237	296	Weekly	Composite	lb/day
Total As	11.3	27.4	Weekly	Composite	lb/day
Total Cd	1.57	3.93	Weekly	Composite	lb/day
Total Cu	12.1	25.3	Weekly	Composite	lb/day
Total Pb	2.56	5.51	Weekly	Composite	lb/day
Total Zn	8.26	20.1	Weekly	Composite	lb/day

a/ See definitions Part I.A. for definition of terms

Except as provided for in Part I.D.11.b of the permit, there shall be no discharge of process wastewater to navigable water from the active copper dump leach operations.

9. Joint Discharge Area Transitional Waters Monitoring Program:

Kennecott is required to annually sample eight (8) bird eggs, if available, but not to exceed 20% of available eggs, during the nesting season, April 15 through June 30, for the current permit cycle. The eggs will be collected from bird nests in the joint Jordan Valley Outfall 001, UPDES Permit No. UT002836, and Kennecott Outfall 012

affected outfall area. The affected area for egg collection is defined in the Sampling and Analysis Plan. The geometric mean selenium concentration of at least 5 eggs from a single season will be compared to the tissue based selenium water quality standard of 12.5 mg/kg dry weight for Gilbert Bay of Great Salt Lake to demonstrate compliance with the Narrative Standards in the Class 5E Transitional Waters affected by the discharge. Kennecott must notify the Director within 7 business days of becoming aware of any egg concentrations that exceed 9.8 mg/kg. In addition, total mercury concentrations in the egg tissue samples must also be evaluated and reported.

Kennecott will conduct annual bird surveys approximately every two weeks between April 15 and June 30 (four times per season) to document bird abundance, diversity, and use of the Outfall 012 mud flat habitat, particularly for evidence of feeding and nesting using methodology approved by the Director.

Kennecott is required to annually collect co-located macroinvertebrate, water and sediment samples once between April 15 and June 30 and as close in time as practical to the bird egg collection. The requirement to sample and analyze sediment may be excluded if the sampling plan is modified and subsequently approved by the Director. These samples will be analyzed for selenium, biota and sediment will also be analyzed for total mercury, water samples will be analyzed for methyl and total mercury and total dissolved solids or salinity. The co-located macroinvertebrates, sediment and water samples will be collected at up to six (6) evenly spaced locations along the discharge watercourse from the discharge point to the water's edge from where Outfall 012 enters the standing waters of Great Salt Lake. This monitoring will be consistent with the February, 2011 Field Sampling Plan Outfall 001 at Great Salt Lake, Southwest Groundwater Treatment Plant unless modifications are approved in writing by the Director.

Kennecott is required to biannually collect co-located brine shrimp and water samples twice per year from the open waters of Gilbert Bay in the vicinity of the outfall. Sample collection is constrained by brine shrimp dynamics in the sampling area as brine shrimp may not always be present when sampling is attempted. The intent is to collect brine shrimp samples as close as available to where the effluent waters enter Gilbert Bay between April 15 and June 30 and in October. The water sample will be analyzed for total and methyl mercury and selenium. The brine shrimp sample will be analyzed for total mercury and selenium. The open water monitoring will be consistent with the methods described in the 2015 Bi-annual Sampling Results prepared for Jordan Valley Water Conservancy District by CH2M unless modifications are approved in writing by the Director.

DWQ strongly recommends that Kennecott coordinate with other facilities that discharge in the same delta to avoid needless duplication and further impact to avian wildlife in the delta area. Other monitoring requirements may be shared if appropriate. The Director shall be notified as soon as possible, but no later than April 1, if the efforts to coordinate monitoring with other dischargers to the delta area are

unsuccessful. A Sampling and Analysis Plan will be submitted to the Director for approval within 90-days of permit issuance for implementation beginning in 2018 that describes the methods and analysis to meet the requirements of condition I.D.9. Prior to approval, the Director will hold at least a 30 day public comment period. A detailed report, including field and laboratory data, analysis and a summary of the results from the bird surveys, egg samples and co-located water, sediment and macroinvertebrates monitoring must be submitted to the DWQ by February 1, or another agreed upon date, following the end of the calendar year for which the results were obtained.

10. Implementation of the 12.5 mg/kg Se Tissue Based Standard:

Kennecott is subject to the following actions when the annual geometric mean dry weight concentrations outlined below exist in bird eggs (with a minimum sample size of five eggs) collected as part of the approved Joint Discharge Area Transitional Waters Monitoring Program:

9.8 to 12.4 mg/kg Se and above: Kennecott will prepare and if necessary, implement a plan to decrease bird exposures to Se from the effluent unless Kennecott can demonstrate to the Director's satisfaction that the discharge is not the cause of the increasing Se concentrations in eggs. The plan, including an implementation schedule, must be submitted to the Director within 180 days of notice that this condition exists.

12.5 mg/kg Se and above: The reopener provision for this permit will be exercised and Kennecott will be subject to additional Se reductions unless Kennecott can demonstrate to the Director's satisfaction that the discharge is not the cause of the Se exceedances in eggs. If these waters are determined to be impaired, Kennecott may be subject to additional Se reductions under the TMDL process.

11. Storm Exemptions

a. If, as a result of precipitation or snowmelt Outfalls 002, 007 and/or 012 has an overflow or excess discharge of effluent which does not meet the limitations contained in Part I.D.1 and 7, pursuant to 40 CFR 440.131(b), Outfalls 002 and/or 012 may qualify for an exemption from such limitations if the permittee notifies the Director of the event in writing within thirty days of the event and the following conditions are met:

    i. The facility is designed, constructed and maintained to contain 6053 acre feet at the North expansion impoundment. This is the volume which would be generated by the permittee in a 24-hour period without an increase in volume from precipitation plus the maximum volume of wastewater resulting from a 10-year, 24-hour precipitation event. The Facility must be capable of storing the above volumes or

be capable of treating the maximum flow associated with these volumes.

ii. The permittee takes all reasonable steps to maintain treatment of the waste water such as adding lime to maintain pH in the range of 6.5 to 9.0 in the effluent and minimizes the amount of overflow such as not discharging leach water to the tailings pond except for storm runoff at the mine exceeding the 10 year 24-hour storm volume and the conditions of Part I.D.11.b.

iii. The discharge is analyzed for the parameters listed in Part I.D.1.

iv. The discharge is reported pursuant to Part II.I.1-4 and Part II.D.

v. The storm exemption is designed to provide an affirmative defense to an enforcement action. Therefore, the permittee has the burden of demonstrating to the Director that the above conditions have been met.

b. If, as a result of precipitation or snowmelt, other areas of the mine operations have an overflow or discharge which does not meet the limitations established pursuant to 40 CFR 440.131(b), as deemed applicable, the permittee may qualify for an exemption from such limitations with respect to such discharge if the permittee notifies the Director of the event in writing within thirty days of the event and the following conditions are met:

i. The facility is designed, constructed, and maintained to contain the maximum volume of waste water stored by the facility during normal operating conditions (without an increase in volume from precipitation) plus the maximum volume of waste water resulting from a 10-year, 24-hour precipitation event. In computing the maximum volume of waste water which would result from a 10-year, 24-hour precipitation event, the permittee must include the volume which would result from all areas contributing runoff to the facility, i.e., all runoff that is not diverted from the area, or process subject to zero discharge, and other runoff that is allowed to commingle with the influent to the treatment system.

ii. The permittee takes all reasonable steps to minimize the overflow or excess discharge such as containment and reuse where practical.

iii. There is no discharge of leach water to Bingham Creek or the Jordan River.

iv. The permittee complies with the notification requirements of the permit. The storm exemption is designed to provide an affirmative

defense to an enforcement action. Therefore, the operator has the burden of demonstrating to the appropriate authority that the above conditions have been met.

12. Whole Effluent Toxicity (WET) Testing

a. Acute Toxicity.

Effective immediately, and lasting through the life of this permit, there shall be no acute toxicity for Ceriodaphnia dubia in outfall 002 discharge, and no acute toxicity for *Cyprinodon variegatus* (sheepshead minnow) at outfalls 007 or 012 discharge as defined in *Part D.13* and determined by test procedures described below.

Effective immediately, the permittee will sample monthly the calcium concentration of the 012 outfall. If the calcium concentration drops below 350 mg/L, a 96-hour acute toxicity test using *Mysidopsis bahia* (mysid shrimp) will be conducted to determine the appropriateness of this species for the 012 outfall.

Starting on the effective date of this permit, when the maximum individual weekly average flow for outfall 002 is greater than 10 MGD, the permittee shall monthly, conduct acute static replacement toxicity tests on composite samples of the final effluent. The samples shall be collected at outfall 002. Sampling is only required quarterly if the quarterly average flow is less than 10 MGD and not required if the quarterly average flow has not exceeded 1 MGD. The permittee will also conduct acute static replacement toxicity tests on composite samples of the final effluent on a quarterly basis for outfall 012. Sampling is not required if the quarterly average flow has not exceeded 1 MGD. A yearly spring time acute biomonitoring test using *Ceriodaphnia dubia* is also required for outfall 010. Acute biomonitoring testing using *Cryprinodon variegatus* (sheepshead minnow) will be required at outfall 007 if the quarterly average flow has exceeded 1 MGD. Sampling is not required if the quarterly average flow has not exceeded 1 MGD.

The monitoring frequency for acute tests shall be as specified in the previous paragraph unless a sample is found to be acutely toxic during a routine test. If that occurs, the monitoring frequency shall become weekly (See *Part I.D.12.a, Accelerated Testing*). Samples shall be collected on a two day progression; i.e., if the first sample is on a Monday, during the next sampling period, the sampling shall begin on a Wednesday, etc. In the event of an acute toxicity test failure, the Permittee shall still be in compliance with the permit, as long as the Permittee is complying with the requirements of Part D.13of this permit.

The replacement static acute toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fourth Edition. August 1993, EPA/600/4-90/027F* as per *40 CFR 136.3(a) TABLE IA-LIST OF APPROVED BIOLOGICAL METHODS,* and the *Region VIII EPA NPDES Acute Test Conditions - Static Renewal Whole Effluent Toxicity Test (August, 1997).* In the case of conflicts, the Region VIII procedures will prevail. The permittee shall conduct the 96-hour static replacement toxicity test for outfall 012 using *Cyprinodon variegatus*, and for outfalls 002, and 010 48-hour tests using *Ceriodaphnia dubia.*

Acute toxicity occurs when 50 percent or more mortality is observed for either species at any effluent concentration. Mortality in the control must simultaneously be 10 percent or less for the results to be considered valid. If more than 10 percent control mortality occurs, the test shall be repeated until satisfactory control mortality is achieved. A variance to this requirement may be granted by the Director if a mortality of less than 10 percent was observed in higher effluent dilutions.

If the permit contains a total residual chlorine limitation greater than 0.20 mg/L, the permittee may request from the Director approval to dechlorinate the sample, or collect the sample prior to chlorination.

Quarterly test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the end of the reporting quarter, e.g., biomonitoring results for the calendar quarter ending March 31 shall be reported with the DMR due April 28, with the remaining biomonitoring reports submitted with DMRs due each July 28, October 28, and January 28. Monthly test results shall be reported along with the DMR submitted for that month. The format for the report shall be consistent with the latest revision of the *Region VIII Guidance for Acute Whole Effluent Reporting (August, 1997)* and shall include all chemical and physical data as specified.

If the results for one year of testing indicate no acute toxicity, the permittee may request a reduction in testing frequency. The Director may approve, partially approve, or deny the request based on results and other available information. If approval is given, the modification will take place without a public notice.

b. *Whole Effluent Testing – Chronic Toxicity.*

Chronic WET tests are considered an indicator for Class 5 waters (Great Salt Lake) because of uncertainties regarding the representativeness of the standard

test species for Great Salt Lake. The results of the acute duration portion of a chronic test are implemented as specified above, in Section ID.13.a. As an indicator, the chronic test results can demonstrate compliance with portions of the Narrative Standards (R317-2-7.2). However, the chronic WET test results alone do not demonstrate noncompliance with the Narrative Standards. As indicators, the chronic WET test results alone are not used for determining reasonable potential for toxicity or noncompliance with the permit. The Director may modify the chronic WET testing requirements including the cessation of chronic WET testing without a public notice, as warranted and appropriate.

The monitoring frequency for Chronic WET testing shall be quarterly for *Cryprinodon variegatus* (Sheepshead Minnow) at Outfall 012. Samples shall be collected on a two-day progression; i.e., if the first sample is on a Monday, during the next sampling period, sampling shall be on a Wednesday. If chronic toxicity is detected, the test shall be repeated in less than four weeks from the date the initial sample was taken. The need for any additional samples, and/or a Toxicity Reduction Evaluation (TRE), see Part ID.13-f, shall be determined by the Director. If the second test shows no chronic toxicity, routine monitoring shall be resumed.

The chronic toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. Third Edition. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA 821–R–02–014, and the Region VIII EPA NPDES Chronic Test Conditions - Static Renewal Whole Effluent Toxicity Test (August, 1997).* A CO2 atmosphere may be used (in conjunction with an unmodified test) in order to account for artificial pH drift, as previously demonstrated to and authorized by the Director.

Chronic toxicity occurs when, during a chronic toxicity test, the TUc is greater than 1.6. The TUc is calculated by dividing the effluent concentration of 100 percent by the 25% inhibition concentration (IC25) calculated at a 95% confidence level on the basis of test organism survival and growth or survival and reproduction. Concentrations of 100 percent effluent only will be required, plus the control. If any of the acceptable control performance criteria are not met, the test shall be considered invalid.

Quarterly test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the end of the reporting calendar quarter (e.g., biomonitoring results for the calendar quarter ending March 31 shall be reported with the DMR due April 28, with the remaining biomonitoring reports submitted with DMRs due each July 28, October 28, and January 28). All test results shall be reported along with the DMR submitted for that reporting

period. The format for the report shall be consistent with the latest revision of the Region VIII Guidance for Chronic Whole Effluent Reporting (August, 1997) and shall include all the physical testing as specified.

If the results for a minimum of ten consecutive tests indicate no chronic toxicity, the permittee may request a reduction in testing frequency. The Director may approve, partially approve, or deny the request based on results and other available information. If approval is given, the modification will take place without a public notice.

c. *Accelerated Testing.*

When acute toxicity is indicated during routine biomonitoring as specified in this permit, the permittee shall notify the Director in writing within 5 days after becoming aware of the test result. The permittee shall perform an accelerated schedule of biomonitoring to establish whether a pattern of toxicity exists. Accelerated testing will begin within seven days after the permittee becomes aware of the test result. Accelerated testing shall be conducted as specified under *Part I.D.13.d, Pattern of Toxicity.* If the accelerated testing demonstrates no pattern of toxicity, routine monitoring shall be resumed.

d. *Pattern of Toxicity.*

A pattern of toxicity is defined by the results of a series of up to five biomonitoring tests pursuant to the accelerated testing requirements using 100 percent effluent on the species being tested, once every week for up to five consecutive weeks.

If two (2) consecutive tests (not including the scheduled quarterly or monthly test which triggered the search for a pattern of toxicity) do not result in acute toxicity, no further accelerated testing will be required and no pattern of toxicity will be found to exist. The permittee will provide written verification to the Director within 5 days, and resume routine monitoring.

A pattern of toxicity is established if one of the following occurs:

i. If two (2) consecutive test results (not including the scheduled quarterly or monthly test which triggered the search for a pattern of toxicity) indicate acute toxicity, this constitutes an established pattern of toxicity.

ii. If consecutive tests continue to yield differing results each time, the permittee will be required to conduct up to a maximum of five (5) acute tests (not including the scheduled quarterly or monthly test

which triggered the search for a pattern of toxicity). If three out of five test results indicate acute toxicity, this will constitute an established pattern of toxicity.

e. *Preliminary Toxicity Investigation*

When a pattern of toxicity is detected the permittee will notify the Director in writing within 5 days and begin an evaluation of the possible causes of the toxicity. The permittee will have 15 working days from demonstration of the pattern of toxicity to complete a Preliminary Toxicity Investigation (PTI) and submit a written report of the results to the Director. The PTI may include, but is not limited to, additional chemical and biological monitoring, examination of pretreatment program records, examination of discharge monitoring reports, a thorough review of the testing protocol, evaluation of treatment processes and chemical use, inspection of material storage and transfer areas to determine if a spill may have occurred, and similar procedures.

If the PTI identifies a probable toxicant and/or a probable source of toxicity, the permittee shall submit, as part of its final results, written notification of that effect to the Director. Within thirty days of completing the PTI the permittee shall submit for approval a control program to control effluent toxicity and shall proceed to implement such plan within seven days following approval. The control program, as submitted to or revised by the Director, may be incorporated into the permit.

If no probable explanation for toxicity is identified in the PTI, the permittee shall notify the Director as part of its final report, along with a schedule for conducting a Phase I Toxicity Reduction Evaluation (TRE) (See *Part I.D.13.f, Toxicity Reduction Evaluation*).

If toxicity spontaneously disappears during the PTI, the permittee shall submit written notification to that effect to the Director as part of the reporting requirements of paragraphs a and b of this section.

f. *Toxicity Reduction Evaluation (TRE).*

If toxicity is detected during the life of this permit and it is determined by the Director that a TRE is necessary, the permittee shall be so notified and shall initiate a TRE immediately thereafter. The purpose of the TRE will be to establish the cause of the toxicity, locate the source(s) of the toxicity, and control or provide treatment for the toxicity.

A TRE may include but is not limited to one, all, or a combination of the following:

Phase I - Toxicity Characterization
Phase II - Toxicity Identification Procedures
Phase III - Toxicity Control Procedures
Any other appropriate procedures for toxicity source elimination and control

If the TRE establishes that the toxicity cannot be immediately eliminated the permittee shall submit a proposed compliance plan to the Director. The plan shall include the proposed approach to control toxicity and a proposed compliance schedule for achieving control. If the approach and schedule are acceptable to the Director, this permit may be reopened and modified.

If the TRE shows that the toxicity is caused by a toxicant(s) that may be controlled with specific numerical limitations, the permittee may:

i. Submit an alternative control program for compliance with the numerical requirements.
ii. If necessary, provide a modified biomonitoring protocol which compensates for the pollutant(s) being controlled numerically.

If acceptable to the Director, this permit may be reopened and modified to incorporate any additional numerical limitations, a modified compliance schedule if judged necessary by the Director, and/or a modified biomonitoring protocol.

Failure to conduct an adequate TRE, or failure to submit a plan or program as described above, or the submittal of a plan or program judged inadequate by the Director, shall be considered a violation of this permit.

E. **Biosolids Requirements** Error! Bookmark not defined.

1. Biosolids Treatment and Disposal. The authorization to dispose of biosolids provided under this permit is limited to those biosolids produced from the treatment works owned and operated by the permittee. The treatment methods and disposal practices are designated below.

   a. Treatment

      (1) Biosolids are dewatered then transferred to a collocated landfill at the facility.

   b. Description of Biosolids Disposal Method

      (1) Biosolids may be disposed of in a landfill, or transferred to another facility for treatment/disposal.

   c. Changes in Treatment Systems and Disposal Practices.

      (1) Should the permittee change their disposal methods or the biosolids generation and handling processes of the plant, the permittee must notify the Director at least 30 days in advance if the process/method is specified in 40 CFR 503. This includes, but is not limited to, the permanent addition or removal of any biosolids treatment units (i.e., digesters, drying beds, belt presses, etc.) and/or any other change.

      (2) Should the permittee change their disposal methods or the biosolids generation and handling processes of the plant, the permittee must notify the Director at least 180 days in advance if the process/method is not specified in 40 CFR 503. This includes, but is not limited to, the permanent addition or removal of any biosolids treatment units (i.e., digesters, drying beds, belt presses, etc.) and/or any other change.

   For any biosolids that are land filled, the requirements in Section 2.12 of the latest version of the EPA Region VIII Biosolids Management Handbook must be followed.

2. Specific Limitations and Monitoring Requirements. All biosolids generated by this facility to be sold or given away to the public shall meet the requirements of Part III.B.1, 2, 3 and 4 listed below

   a. Metals Limitations. All biosolids sold or given away in a bag or similar container for application to lawns and home gardens must meet the metals limitations as described below. If these metals limitations are not met, the biosolids must be landfilled

Pollutant Limits, (40 CFR Part 503.13(b)) Dry Mass Basis				
Heavy Metals	Table 1	Table 2	Table 3	Table 4
	Ceiling Conc. Limits, (mg/kg)	CPLR[1], (mg/ha)	Pollutant Conc. Limits, (mg/kg)	APLR[2], (mg/ha-yr)
Total Arsenic	75	41	41	41
Total Cadmium	85	39	39	39
Total Copper	4300	1500	1500	1500
Total Lead	840	300	300	300
Total Mercury	57	17	17	17
Total Molybdenum	75	N/A	N/A	N/A
Total Nickel	420	420	420	420
Total Selenium	100	100	100	100
Total Zinc	7500	2800	2800	2800

b. Pathogen Limitations. All biosolids sold or given away in a bag or a similar container for application to lawns and home gardens must meet the pathogen limitations for Class A. Land applied biosolids must meet the pathogen limitations for Class B as described below. If the pathogen limitations are not met, the biosolids must be landfilled.

(1) Class A biosolids shall meet one of the pathogen measurement requirements in the following Pathogen Control Class table or shall meet the requirements for a Process to Further Reduce Pathogens as defined in *40 CFR Part 503.32(a) Sewage Sludge – Class A.*

(2) Class B biosolids shall meet the pathogen measurement requirements in the following Pathogen Control Class table or shall meet the requirements for a Process to Significantly Reduce Pathogens as defined in 40 CFR Part 503.32(b) *Sewage Sludge – Class B.* In addition, the permittee shall comply with all applicable site restrictions listed below *(40 CFR Part 503.32,(b),(5)):*

(a) Food crops with harvested parts that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after application.

(b) Food crops with harvested parts below the land surface shall not be harvested for 20 months after application if the biosolids remains on the land surface for four months or more prior to incorporation into the soil.

1 CPLR -- Cumulative Pollutant Loading Rate
2 APLR – Annual Pollutant Loading Rate

(c) Food crops with harvested parts below the surface of the land shall not be harvested for 38 months after application of sewage sludge when the sewage sludge remains on the land surface for less than four months prior to incorporation into the soil.

(d) Food crops, feed crops, and fiber crops shall not be harvested from the land for 30 days after application.

(e) Animals shall not be allowed to graze on the land for 30 days after application.

(f) Turf grown on land where biosolids is applied shall not be harvested for one year after application if the harvested turf is placed on either land with a high potential for public exposure or a lawn.

(g) Public access to land with a high potential for public exposure shall be restricted for one year after application.

(h) Public access to land with a low potential for public exposure shall be restricted for 30 days after application.

(i) The sludge or the application of the sludge shall not cause or contribute to the harm of a threatened or endangered species or result in the destruction or adverse modification of critical habitat of a threatened or endangered species after application.

Pathogen Control Class	
Class A	Class B
B Salmonella species –less than three (3) MPN[3] per four (4) grams total solids (or less than 1,000 fecal coliforms per gram total solids)	Fecal Coliforms –less than 2,000,000 colony forming units (CFU) per gram total solids
Enteric viruses –less than one (1) MPN (or plaque forming unit) per four (4) grams total solids	
Viable helminth ova –less than one (1) MPN per four (4) grams total solids	

(3) Vector Attraction Reduction Requirements.

(a) The permittee will meet vector attraction reduction through use of one of the methods listed in *40 CFR 503.33*. Kennecott is meeting the requirements though the following methods

[3] MPN –Most Probable Number

i) Kennecott dewaters the biosolids and bags them, then transfers them to the onsite landfill for disposal.

If the permittee intends to use another one of the alternatives, the Director and the EPA must be informed at least thirty (30) days prior to its use. This change may be made without additional public comment.

(4) Self-Monitoring Requirements.

(a) At a minimum, upon the effective date of this permit, all chemical pollutants, pathogens and applicable vector attraction reduction requirements shall be monitored according to *40 CFR 503.16(1)(a)*.

Minimum Frequency of Monitoring (40 CFR Part 503.16, 503.26. and 503.46)		
Amount of Biosolids Disposed Per Year		Monitoring Frequency
Dry US Tons	Dry Metric Tons	Per Year or Batch
> 0 to < 320	> 0 to < 290	Once Per Year or Batch
> 320 to < 1650	> 290 to < 1,500	Once a Quarter or Four Times
> 1,650 to < 16,500	> 1,500 to < 15,000[4]	Bi-Monthly or Six Times
> 16,500	> 15,000	Monthly or Twelve Times

(b) Sample collection, preservation and analysis shall be performed in a manner consistent with the requirements of *40 CRF 503* and/or other criteria specific to this permit. A metals analysis is to be performed using *Method SW 846* with *Method 3050* used for digestion. For the digestion procedure, an amount of biosolids equivalent to a dry weight of one gram shall be used. The methods are also described in the latest version of the *Region VIII Biosolids Management Handbook.*

(c) The Director may request additional monitoring for specific pollutants derived from biosolids if the data shows a potential for concern.

(d) After two (2) years of monitoring at the frequency specified, the permittee may request that the Director reduce the sampling frequency for the heavy metals. The frequency cannot be reduced to less than once per year for biosolids that are sold or given away to the public for any parameter. The frequency also cannot be reduced for any of the pathogen or vector attraction reduction requirements listed in this permit.

3. Management Practices of Biosolids

[4] Permittee produces approximately 1200 pounds (<1DMT), therefor they only need to sample one time a year. However, Kennecott is not required to monitor for heavy metals or pathogens if the biosolids are disposed of in a landfill.

a. Biosolids Distribution Information

(1) For biosolids that are sold or given away, an information sheet shall be provided to the person who receives the biosolids. The label or information sheet shall contain:

(a) The name and address of the person who prepared the biosolids for a sale or to be given away.

(b) A statement that prohibits the application of the biosolids to the land except in accordance with the instructions on the label or information sheet.

b. Biosolids Application Site Storage

(1) For biosolids or material derived from biosolids that are stored in piles for one year or longer, measures shall be taken to ensure that erosion (whether by wind or water) does not occur. However, best management practices should also be used for piles used for biosolids treatment. If a treatment pile is considered to have caused a problem, best management practices could be added as a requirement in the next permit renewal

c. Land Application Practices

(1) The permittee shall operate and maintain the land application site operations in accordance with the following requirements:

(a) The permittee shall provide to the Director and the EPA within 90 days of the effective date of this permit a land application plan.

(b) Application of biosolids shall be conducted in a manner that will not contaminate the groundwater or impair the use classification for that water underlying the sites.

(c) Application of biosolids shall be conducted in a manner that will not cause a violation of any receiving water quality standard from discharges of surface runoff from the land application sites. Biosolids shall not be applied to land 10 meters or less from waters of the United States (as defined in 40 CFR 122.2).

(d) No person shall apply biosolids for beneficial use to frozen, ice-covered, or snow-covered land where the slope of such land is greater than three percent and is less than or equal to six percent unless one of the following requirements is met:

i) there is 80 percent vegetative ground cover; or,

ii) approval has been obtained based upon a plan demonstrating adequate runoff containment measures.

(e) Application of biosolids is prohibited to frozen, ice-covered, or snow covered sites where the slope of the site exceeds six percent.

(f) Agronomic Rate

i) Application of biosolids shall be conducted in a manner that does not exceed the agronomic rate for available nitrogen of the crops grown on the site. At a minimum, the permittee is required to follow the methods for calculating agronomic rate outlined in the latest version of the *Region VIII Biosolids Management Handbook* (other methods may be approved by the Director). The treatment plant shall provide written notification to the applier of the biosolids of the concentration of total nitrogen (as N on a dry weight basis) in the biosolids. Written permission from the Director is required to exceed the agronomic rate.

ii) The permittee may request the limits of *Part III, C, 6* be modified if different limits would be justified based on local conditions. The limits are required to be developed in cooperation with the local agricultural extension office or university.

iii) Deep soil monitoring for nitrate-nitrogen is required for all land application sites (does not apply to sites where biosolids are applied less than once every five years). A minimum of six samples for each 320 (or less) acre area is to be collected. These samples are to be collected down to either a 5 foot depth, or the confining layer, whichever is shallower (sample at 1 foot, 2 foot, 3 foot, 4 foot and 5 foot intervals). Each of these one-foot interval samples shall be analyzed for nitrate-nitrogen. In addition to the one-foot interval samples, a composite sample of the 5 foot intervals shall be taken, and analyzed for nitrate-nitrogen as well. Samples are required to be taken once every five years for non-irrigated sites that receive more than 18 inches of precipitation annually or for irrigated sites

(g) Biosolids shall not be applied to any site area with standing surface water. If the annual high groundwater level is known or suspected to be within five feet of the surface, additional deep soil monitoring for nitrate-nitrogen as described in *Part III.C.(6),(c).* is to be performed. At a minimum, this additional monitoring will involve a collection of more samples in the affected area and possibly more frequent sampling. The exact number of samples to be collected will be outlined in a deep soil monitoring plan to be

submitted to the Director and the EPA within 90 days of the effective date of this permit. The plan is subject to approval by the Director.

(h) The specified cover crop shall be planted during the next available planting season. If this does not occur, the permittee shall notify the Director in writing. Additional restrictions may be placed on the application of the biosolids on that site on a case-by-case basis to control nitrate movement. Deep soil monitoring may be increased under the discretion of the Director.

(i) When weather and or soil conditions prevent adherence to the biosolids application procedure, biosolids shall not be applied on the site.

(j) For biosolids that are sold or given away, an information sheet shall be provided to the person who receives the biosolids. The label or information sheet shall contain:

i) The name and address of the person who prepared the biosolids for sale or give away for application to the land.

ii) A statement that prohibits the application of the biosolids to the land except in accordance with the instructions on the label or information sheet.

iii) The annual whole biosolids application rate for the biosolids that do not cause the metals loading rates in Tables 1, 2, and 3 (*Part III.B.1.*) to be exceeded.

(k) Biosolids subject to the cumulative pollutant loading rates in Table 2 (*Part III.B.1.*) shall not be applied to agricultural land, forest, a public contact site, or a reclamation site if any of the cumulative pollutant loading rates in Table 2 have been reached.

(l) If the treatment plant applies the biosolids, it shall provide the owner or leaseholder of the land on which the biosolids are applied notice and necessary information to comply with the requirements in this permit.

(m) The permittee shall inspect the application of the biosolids to active sites to prevent malfunctions and deterioration, operator errors and discharges, which may cause or lead to the release of biosolids to the environment or a threat to human health. The permittee must conduct these inspections often enough to identify problems in time to correct them before they harm human health or the environment. The permittee shall keep an inspection log or summary including at least the date and time of inspection, the printed name and the handwritten signature of the inspector, a notation of

observations made and the date and nature of any repairs or corrective action.

4. Special Conditions on Biosolids Storage. Permanent storage of biosolids is prohibited. Biosolids shall not be temporarily stored for more than two (2) years. Written permission to store biosolids for more than two years must be obtained from the Director. Storage of biosolids for more than two years will be allowed only if it is determined that significant treatment is occurring.

5. Representative Sampling. Biosolids samples used to measure compliance with *Part III* of this Permit shall be collected at locations representative of the quality of biosolids generated at the treatment works and immediately prior to land application.

6. Reporting of Monitoring Results.

   a. Biosolids. The permittee shall provide the results of all monitoring performed in accordance with *Part III.B*, and information on management practices, biosolids treatment, site restrictions and certifications shall be provided no later than February 19 of each year. Each report is for the previous calendar year. If no biosolids were sold or given away during the reporting period, "no biosolids were sold or given away" shall be reported. Legible copies of these, and all other reports required herein, shall be signed and certified in accordance with the *Signatory Requirements* (see *Part VII.G*), and submitted to the Utah Division of Water Quality by NetDMR[5] or at the following:

      Original to: Biosolids Coordinator
      Utah Division of Water Quality
      P. O. Box 144870
      Salt Lake City Utah, 84114-4870

7. Additional Record Keeping Requirements Specific to Biosolids.

   a. Unless otherwise required by the Director, **the permittee is not required to keep records** on compost products if the permittee prepared them from biosolids that meet the limits in Table 3 (*Part III.B.1*), the Class A pathogen requirements in *Part III.B.2* and the vector attraction reduction requirements in *Part III.B.3*. The Director may notify the permittee that additional record keeping is required if it is determined to be significant to protecting public health and the environment.

   b. **The permittee is required** to keep the following information for at least 5 years:

      (1) Concentration of each heavy metal in Table 3 (*Part III.B.1*).

5 Starting January 1, 2017 monitoring results must be submitted using NetDMR unless the permittee has successfully petitioned for an exception. Annual Biosolids Reports should also be submitted through this system.

(2) A description of how the pathogen reduction requirements in *Part III.B.2* were met.

(3) A description of how the vector attraction reduction requirements in *Part III.B.3* were met.

(4) A description of how the management practices in *Part III.C* were met (if necessary).

(5) The following certification statement:

"I certify under the penalty of law, that the heavy metals requirements in *Part III.B.1*, the pathogen requirements in *Part III.B.2*, the vector attraction requirements in *Part III.B.3*, the management practices in *Part III.C*. This determination has been made under my direction and supervision in accordance with the system designed to assure that qualified personnel properly gather and evaluate the information used to determine that the pathogen requirements, the vector attraction reduction requirements and the management practices have been met. I am aware that there are significant penalties for false certification including the possibility of imprisonment."

c. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit and records of all data used to complete the application for this permit for the life of the permit. Data collected on site, copies of Biosolids Report forms, and a copy of this UPDES biosolids-only permit must be maintained on site during the duration of activity at the permitted location

F. **Storm Water Pollution Prevention Plan.**

It has been determined that the Permittee has a regulated storm water discharge as per *UAC R317.8.* Individual UPDES permit UT0000051 covers discharges from industrial activities (Ore Mining & Dressing) and all discharges of storm water from Kennecott permitted outfalls, which includes provisions relevant to the development of a Storm Water Pollution Prevention Plan (SWPPP). All stormwater discharges associated with mine-related construction at Kennecott's operations are covered by its individual UPDES Permit (UT0000051), including construction related activities. If construction activity discharges could impact an off-site MS4 permitted community, Kennecott shall obtain a separate construction Stormwater Permit (NOI) and associated SWPPP developed.

1. Deadlines for Plan Preparation and Compliance. The storm water pollution prevention plan from the previous permit, as required under *Part I.E.*, will remain in effect until the current plan is modified and implemented. The new plan shall be implemented within 90 days of issuance of this permit unless the Director gives

written approval extending the implementation time for parts of the plan.

2. Signature and Plan Review.

   a. The plan shall be signed in accordance with *Part IV.G.* (Signatory Requirements), and be retained on site at the facility which generates the storm water discharge.

   b. The permittee shall make plans available upon request to the *Director*, or authorized representative.

   c. Required modifications. The *Director* may notify the permittee at any time that the plan does not meet one or more of the minimum requirements of this part. Such notification shall identify those provisions of the permit that are not being met by the plan and identify which provisions of the plan require modifications in order to meet the minimum requirements of this part. Within 30 days of such notification from the *Director* the permittee shall make the required changes to the plan and shall submit to the *Director* a written certification that the requested changes have been made.

3. Pollution Prevention Team. Each plan shall identify a specific individual or individuals within the facility organization as members of a storm water Pollution Prevention Team that are responsible for developing the storm water pollution prevention plan and assisting the facility or plant manager in its implementation, maintenance, and revision. The plan shall clearly identify the responsibilities of each team member. The activities and responsibilities of the team shall address all aspects of the facility's storm water pollution prevention plan.

4. Description of Potential Pollutant Sources. Each plan shall provide a description of potential sources which may reasonably be expected to add significant amounts of pollutants to storm water discharges or which may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility. Each plan shall identify all activities (including all construction related activities) and significant materials which may potentially be significant pollutant sources. Each plan shall include, at a minimum:

   a. Drainage.

      i. A site map indicating, an outline of the portions of the drainage area of each storm water outfall that are within the facility boundaries, each existing structural control measure to reduce pollutants in storm water runoff, surface water bodies, locations where significant materials are exposed to precipitation, locations where major spills or leaks have occurred, and the locations of the following activities where such activities are exposed to precipitation: fueling stations, vehicle and

equipment maintenance and/or cleaning areas, loading/unloading areas, locations used for the treatment, storage or disposal of wastes, liquid storage tanks, processing areas and storage areas.

ii. For each area of the facility that generates storm water discharges associated with industrial activity with a reasonable potential for containing significant amounts of pollutants the permittee shall make a prediction of the direction of flow, and an identification of the types of pollutants which are likely to be present in storm water discharges associated with industrial activity. Factors to consider include the toxicity of chemicals; quantity of chemicals used, produced or discharged; the potential of contact with storm water; and history of significant leaks or spills of toxic or hazardous pollutants. Flows with a significant potential for causing erosion shall be identified.

b. Inventory of Exposed Materials. An inventory of the types of materials handled at the site that potentially may be exposed to precipitation and discharged to surface or groundwater. Such inventory shall include a narrative description of significant materials that have been handled, treated, stored or disposed in a manner to allow exposure to storm water between the time of three years prior to the date of the issuance of this permit and the present; method and location of on-site storage or disposal; materials management practices employed to minimize contact of materials with storm water runoff between the time of three years prior to the date of the issuance of this permit and the present; the location and a description of existing structural and non-structural control measures for regulated activities, including all construction related activities, to reduce pollutants in storm water runoff; and a description of any treatment the storm water receives. This description should also include areas with the potential for deposition activities. The description shall be updated whenever there is a significant change in the type or quantity of exposed materials or material management practices, which may affect the exposure of materials to storm water. Those updates will include any new exposures related to waste rock or overburden management.

c. Spills and Leaks. A list of significant spills and significant leaks of toxic or hazardous pollutants (if any) that have occurred at areas that are exposed to precipitation or that otherwise drain to a storm water conveyance at the facility after the date of three years prior to the effective date of this permit. Such list shall be updated as appropriate during the term of the permit.

d. Sampling Data. A summary of existing discharge sampling data describing pollutants in storm water discharges from the facility, including a summary of sampling data collected during the term of this permit.

e. Risk Identification and Summary of Potential Pollutant Sources. A narrative

description of the potential pollutant sources from the following activities: loading and unloading operations; outdoor storage activities; outdoor manufacturing or processing activities; significant dust or particulate generating processes; and on-site waste disposal practices. The description shall specifically list any significant potential source of pollutants at the site and for each potential source, any pollutant or pollutant parameter (e.g. biochemical oxygen demand, etc.) of concerns shall be identified.

5. Measures and Controls. Each facility covered by this permit shall develop a description of storm water management controls appropriate for the facility and implement such controls. The appropriateness and priorities of controls in a plan shall reflect identified potential sources of pollutants at the facility. The description of storm water management controls shall address the following minimum components, including a schedule for implementing such controls:

   a. Good housekeeping. Good housekeeping requires the maintenance of areas which may contribute pollutants to storm water discharges in a clean, orderly manner. The pollution prevention plan should consider implementation of the following measures where applicable:

      i. Establish a cleaning or maintenance program for all impervious areas of the facility where particulate matter, dust, or debris may accumulate, particularly areas of material loading/unloading, material storage and handling, and processing.

      ii. Paved areas of vehicle traffic or material storage where vegetative or other stabilization methods are not practical. Institute sweeping programs in these areas as well.

      iii. For unstabilized areas of the facility where sweeping is not practical, storm water management devices such as sediment traps, vegetative buffer strips, filter fabric fence, sediment filtering boom, gravel outlet protection or other equivalent measures, that effectively trap or remove sediment should be considered.

   b. Source Controls. The permittee shall consider preventive measures to minimize the potential exposure of all significant materials (as described in Part I.E.4 of this section) to precipitation and storm water runoff. The permittee should consider in a narrative description the implementation of the following measures to reduce the exposure of all materials to storm water:

      i. Relocate all materials, including raw materials, intermediate products, material handling equipment, obsolete equipment, and wastes currently stored outside to inside locations.

ii. Establishment of a schedule for removal of wastes and obsolete equipment to minimize the volume of these materials stored onsite that may be exposed to storm water.

iii. Substitution of less hazardous materials, or materials less likely to contaminate storm water, or substitution of recyclable materials for nonrecyclables whenever possible.

iv. Constructing permanent or semipermanent covers, or other similar forms of protection over stockpiled materials, material handing and processing equipment. Options include roofs, tarps, and covers. This may also include the use of containment bins or covered dumpsters for raw materials, waste materials and nonrecyclables waste materials.

v. Dikes, berms, curbs, trenches, or other equivalent measures to divert run on from material storage, processing, or waste disposal areas.

vi. Implement and enforce, as appropriate, site-specific Project SWPPPs for all construction or other related activities consistent with Best Management Practices (BMPs). BMPs should be site-specific and designed to be as close to the disturbance foot print as practicable as identified in the project-specific Stormwater Pollution Prevention Plan (SWPPP) provisions. Sediment discharge control structures will be evaluated on a site/project specific basis and incorporated into the site/project construction SWPPP to ensure proper design.

vii. After construction, the sites will be managed under the site-wide UPDES UT0000051 SWPPP.

c. Preventive Maintenance. A preventive maintenance program shall involve inspection and maintenance of storm water management devices (e.g. cleaning oil/water separators, catch basins) as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters, and ensuring appropriate maintenance of such equipment and systems.

d. Spill Prevention and Response Procedures. Areas where potential spills which can contribute pollutants to storm water discharges can occur, and their accompanying drainage points shall be identified clearly in the storm water pollution prevention plan. Where appropriate, specifying material handling procedures, storage requirements, and use of equipment such as diversion valves in the plan should be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a clean up should be available to personnel.

e. Inspections. In addition to or as part of the comprehensive site evaluation required under this permit, qualified facility personnel shall be identified to inspect designated equipment and areas of the facility at appropriate intervals specified in the plan. A set of tracking or follow up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections shall be maintained.

f. Employee Training. Employee training programs shall inform personnel responsible for implementing activities identified in the storm water pollution prevention plan or otherwise responsible for storm water management at all levels of responsibility of the components and goals of the storm water pollution prevention plan. Training should address topics such as spill response, good housekeeping and material management practices. A pollution prevention plan shall identify periodic dates for such training. In all cases training must be held at least annually.

g. Record keeping and Internal Reporting Procedures. A description of incidents such as spills, or other discharges, along with other information describing the quality and quantity of storm water discharges shall be included in the plan required under this part. Inspections and maintenance activities shall be documented and records of such activities shall be incorporated into the plan.

h. Non-Storm Discharges.

i. The permittee's current certification will be accepted and considered complete. However, the plan shall include a certification that any new discharges have been tested or evaluated for the presence of non-storm water discharges. The certification shall include the identification of potential significant sources of non-storm water at the site, a description of the results of any test and/or evaluation for the presence of non-storm water discharges, the evaluation criteria or testing method used, the date of any testing and/or evaluation, and the on-site drainage points that were directly observed during the test. The certification must be signed in accordance with signatory requirements in *Part IV.G Signatory Requirements* of this permit. A discharger that is unable to provide certification required by this paragraph must notify the *Director*.

ii. Except for flows from fire fighting activities, sources of non-storm water that are combined with storm water discharges associated with industrial activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

iii. Failure to Certify. If the permittee is unable to provide the certification required for new discharges (testing for non-storm water discharges), the facility must notify the Director within 30 days of construction of the new discharge. If the failure to certify is caused by the inability to perform adequate tests or evaluations, such notification shall describe: The procedure of any test conducted for the presence on non-storm water discharges; the results of such tests or other relevant observations; potential sources of non-storm water discharges to the storm sewer; and why adequate test from such storm sewers were not feasible. Non-storm water discharges to waters of the United States that are not authorized by an NPDES permit are unlawful and must be terminated.

i. Sediment and Erosion Control. The plan shall identify areas which, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify structural, vegetative, and/or stabilization measures to limit erosion. The plan shall also contain a narrative consideration of the appropriateness of traditional storm water management practices (practices other than those that control the generation or sources of pollutants) used to divert, infiltrate, reuse, or otherwise mange storm water runoff in a manner that reduces pollutants in storm water discharges from the site. The plan shall provide that measures that the permittee determines to be reasonable and appropriate shall be implemented and maintained. The potential of various sources at the facility to contribute pollutants to storm water discharges associated with industrial activity (see paragraph Part I.F.4 of this section (Description of Potential Pollutant Sources) shall be considered when determining reasonable and appropriate measures. Appropriate measures may include; vegetative swales and practices, reuse of collected water (such as for a process or irrigation source), inlet controls (such as oil/water separators), snow management activities, infiltration deicers, and wet detention/retention devices.

j. Management of Runoff. Facilities shall consider implementation of the following storm water management practices to address pollutants of concern:

i. Vegetative buffer strips, filter fabric fence, sediment filtering boom, or other equivalent measures, that effectively trap or remove sediment prior to discharge through an inlet or catch basin.

ii. Media filtration such as catch basin filters and sand filters.

iii. Oil/water separators or the equivalent

iv. Structural BMPs such as settling basins, sediment traps, retention or detention ponds, recycling ponds or other equivalent measures.

Appropriate measures may include: vegetative swales and practice, reuse of collected storm water (such as for a process or as an irrigation source), inlet controls (such as oil/water separators), snow management activities, infiltration deicers and wet detention/retention devices.

6. Comprehensive Site Compliance Evaluation. Qualified personnel shall conduct site compliance evaluations at appropriate intervals specified in the plan, but, in no case less than once a year. Such evaluations shall provide:

   a. Areas contributing to a storm water discharge associated with industrial activity shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system. Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural storm water management measures, sediment and erosion control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as spill response equipment, shall be made.

   b. Based on the results of the inspection, the description of potential pollutant sources identified in the plan and pollution prevention measures and controls identified in the plan shall be revised as appropriate within two weeks of such inspection and shall provide for implementation of any changes to the plan in a timely manner, but in no case more than twelve weeks after the inspection. A longer time period may be approved by the Director when justified by the permittee.

   c. A report summarizing the scope of the inspection, personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken shall be made and retained as part of the storm water pollution prevention plan for at least one year after coverage under this permit terminates. The report shall identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report shall contain a certification that the facility is in compliance with the storm water pollution prevention plan and this permit. The report shall be signed in accordance with *Part IV.G Signatory Requirements* of this permit.

   Where significant settling or deposition from process emissions are observed during proper operation of existing equipment, the permittee shall consider ways to reduce these emissions including but not limited to: Upgrading or replacing existing equipment; collection runoff from areas of deposition for treatment or recycling; or changes in materials or processes to reduce the generation of particulate matter.

d. Where compliance evaluation schedules overlap with inspections required under Part I.F.5.e, the compliance evaluation may be conducted in place of one such inspection.

7. Consistency with other plans. Storm water pollution prevention plans may reflect requirements for *Spill Prevention Control and Countermeasure ("SPCC")* plans developed for the facility under *Section 311* of the *CWA* or *Best Management Practices ("BMP")* otherwise required by this permit for the facility as long as such requirement is incorporated into the storm water pollution prevention plan.

8. Additional Requirements for Salt Storage. Storage piles of salt used for deicing or other commercial or industrial purposes and which generate a storm water discharge associated with industrial activity which is discharged to waters of the State shall be enclosed or covered to prevent exposure to precipitation, except for exposure resulting from adding or removing materials from the pile.

9. Monitoring Requirements: During the period beginning on the effective date and lasting through the expiration date of this permit storm events greater than 0.1 inches and more than 72 hours after the previous measurable storm at sites SW3 and SW4 shall be monitored at least 2 times per year and sampled if discharge is present, for the same appropriate parameters as listed for the tailings impoundment outfall 012 in Part I.D.7. except for cyanide and biomonitoring. Where practical, samples must consist of a grab sample in the first 30 minutes of the observed discharge for pH, total metals and if a sheen is present oil & grease. In addition to the parameters listed, the permittee shall provide the date and duration (in hours) of the storm events(s) sampled; rainfall measurements or estimates (in inches) of the storm event which generated the sampled runoff; the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and an estimate of the total volume (in gallons) of the discharge sampled. Monitoring is not required after reclamation bond release or reclamation has reduced values to background levels.

10. Sampling Waiver. When unable to collect samples due to adverse climatic conditions, the discharger must submit in lieu of sampling data a description of why samples could not be collected, including available documentation of the event. Adverse weather conditions which may prohibit the collections samples includes weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, electrical storms, etc.) or otherwise make the collection of a sample impractical (drought, extended frozen conditions, etc).

11. Reporting. Monitoring results shall be reported with the monthly Discharge Monitoring Report within 60 days of sampling.

12. EPCRA Section 313 Requirements. In areas where Section 313 water priority chemicals are stored, processed or otherwise handled, appropriate containment, drainage control and/or diversionary structures shall be provided. At a minimum, one of the following preventive systems or its equivalent shall be used:

    a. Curbing, culverting, gutters, sewers, or other forms of drainage control to prevent or minimize the potential for storm water run-on to come into contact with significant sources of pollutants; or

    b. Roofs, covers or other forms of appropriate protection to prevent storage piles from exposure to storm water and wind.

    c. No tank or container shall be used for the storage of a Section 313 water priority chemical unless its material and construction are compatible with the material stored and conditions of storage such as pressure and temperature, etc.

    d. Liquid storage areas for Section 313 water priority chemicals shall be operated to minimize discharges of Section 313 chemicals. Appropriate measures to minimize discharges of Section 313 chemicals may include secondary containment provided for at least the entire contents of the largest single tank plus sufficient freeboard to allow for precipitation, a strong spill contingency and integrity testing plan, and/or other equivalent measures.

       Material storage areas for Section 313 water priority chemicals other than liquids that are subject to runoff, leaching, or wind shall incorporate drainage or other control features that will minimize the discharge of Section 313 water priority chemicals by reducing storm water contact with Section 313 water priority chemicals.

    e. Truck and rail car loading and unloading areas for liquid Section 313 water priority chemicals shall be operated to minimize discharges of Section 313 water priority chemicals. Protection such as overhangs or door skirts to enclose trailer ends at truck loading/unloading docks shall be provided as appropriate. Appropriate measures to minimize discharges of Section 313 chemicals may include: the placement and maintenance of drip pans (including the proper disposal of materials collected in the drip pans) where spillage may occur (such as hose connections, hose reels and filler nozzles) for use when making and breaking hose connections; a strong spill contingency and integrity testing plan; and/or other equivalent measures.

    f. Processing equipment and materials handling equipment shall be operated so as to minimize discharges of Section 313 water priority chemicals. Materials used in piping and equipment shall be compatible with the substances handled. Drainage from process and materials handling areas shall minimize storm

water contact with Section 313 water priority chemicals. Additional protection such as covers or guards to prevent exposure to wind, spraying or releases from pressure relief vents from causing a discharge of Section 313 water priority chemicals to the drainage system shall be provided as appropriate. Visual inspections or leak tests shall be provided for overhead piping conveying Section 313 water priority chemicals without secondary containment.

g. Drainage from areas covered by paragraphs *a.*, *b.*, *c.*, or *d.* (above) should be restrained by valves or other positive means to prevent the discharge of a spill or other excessive leakage of Section 313 water priority chemicals. Where containment units are employed, such units may be emptied by pumps or ejectors; however, these shall be manually activated.

   Flapper-type drain valves shall not be used to drain containment areas. Valves used for the drainage of containment areas should, as far as is practical, be of manual, open-and-closed design.

   If facility drainage is not engineered as above, the final discharge of all in-facility storm sewers shall be equipped to be equivalent with a diversion system that could, in the event of an uncontrolled spill of Section 313 water priority chemicals, return the spilled material to the facility.

   Records shall be kept of the frequency and estimated volume (in gallons) of discharges from containment areas.

h. Other areas of the facility (those not addressed in paragraphs *a.*, *b.*, *c.*, or *d.*), from which runoff that may contain Section 313 water priority chemicals or spills of Section 313 water priority chemicals could cause a discharge shall incorporate the necessary drainage or other control features to prevent discharge of spilled or improperly disposed material and ensure the mitigation of pollutants in runoff or leachate.

i. All areas of the facility shall be inspected at specific intervals identified in the plan for leaks or conditions that could lead to discharges of Section 313 water priority chemicals or direct contact of storm water with raw materials, intermediate materials, waste materials or products. In particular, facility piping, pumps, storage tanks and bins, pressure vessels, process and material handling equipment, and material bulk storage areas shall be examined for any conditions or failures that could cause a discharge. Inspection shall include examination for leaks, wind blowing, corrosion, support or foundation failure, or other forms of deterioration or noncontainment. Inspection intervals shall be specified in the plan and shall be based on design and operational experience. Different areas may require different inspection intervals. Where a leak or other condition is discovered that may result in significant releases of

Section 313 water priority chemicals to waters of the State, action to stop the leak or otherwise prevent the significant release of Section 313 water priority chemicals to waters of the State shall be immediately taken or the unit or process shut down until such action can be taken. When a leak or noncontainment of a Section 313 water priority chemical has occurred, contaminated soil, debris, or other material must be promptly removed and disposed in accordance with Federal, State, and local requirements and as described in the plan.

j. Facilities shall have the necessary security systems to prevent accidental or intentional entry that could cause a discharge. Security systems described in the plan shall address fencing, lighting, vehicular traffic control, and securing of equipment and buildings.

k. Facility employees and contractor personnel that work in areas where Section 313 water priority chemicals are used or stored shall be trained in and informed of preventive measures at the facility. Employee training shall be conducted at intervals specified in the plan, but not less than once per year. Training shall address: pollution control laws and regulations, the storm water pollution prevention plan and the particular features of the facility and its operation that are designed to minimize discharges of Section 313 water priority chemicals. The plan shall designate a person who is accountable for spill prevention at the facility and who will set up the necessary spill emergency procedures and reporting requirements so that spills and emergency releases of Section 313 water priority chemicals can be isolated and contained before a discharge of a Section 313 water priority chemical can occur. Contractor or temporary personnel shall be informed of facility operation and design features in order to prevent discharges or spills from occurring.

II MONITORING, RECORDING AND REPORTING REQUIREMENTS

A. Representative Sampling. Samples taken in compliance with the monitoring requirements established under *Part I* shall be collected from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge. Sludge samples shall be collected at a location representative of the quality of sludge immediately prior to the use-disposal practice.

B. Monitoring Procedures. Monitoring must be conducted according to test procedures approved under *Utah Administrative Code ("UAC") R317-2-10*, unless other test procedures have been specified in this permit.

C. Penalties for Tampering. The *Act* provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

D. Reporting of Monitoring Results. Monitoring results obtained during the previous month shall be summarized for each month and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), post-marked no later than the 28th day of the month following the completed reporting period. Beginning March 28th , 2017 all DMR submittals must be completed through NetDMR. The first report is due by the 28th of the month after permit effective date. If no discharge occurs during the reporting period, "no discharge" shall be reported. Legible copies of these, and all other reports including whole effluent toxicity (WET) test reports required herein, shall be signed and certified in accordance with the requirements of *Signatory Requirements (see Part IV.G)*, and submitted to the Director, Division of Water Quality and to EPA at the following addresses:

original to: Department of Environmental Quality
Division of Water Quality
288 North 1460 West
PO Box 144870
Salt Lake City, Utah 84114-4870

E. Compliance Schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any Compliance Schedule of this permit shall be submitted no later than 14 days following each schedule date.

F. Additional Monitoring by the Permittee. If the permittee monitors any parameter more frequently than required by this permit, using test procedures approved under *UAC R317-2-10* or as otherwise specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR. Such increased frequency shall also be indicated. Only those parameters required by the permit need to be reported.

G. Records Contents. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements:
2. The individual(s) who performed the sampling or measurements;
3. The date(s) and time(s) analyses were performed;
4. The individual(s) who performed the analyses;
5. The analytical techniques or methods used; and,
6. The results of such analyses.

H. Retention of Records. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time. A copy of this UPDES permit must be maintained on site during the duration of activity at the permitted location.

I. Twenty-four Hour Notice of Noncompliance Reporting.

1. The permittee shall (orally) report any noncompliance which may seriously endanger health or environment as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of circumstances. The report shall be made to the Division of Water Quality, (801) 536-4300, or 24 hour answering service (801) 536-4123.

2. The following occurrences of noncompliance shall be reported by telephone (801) 536-4123 as soon as possible but no later than 24 hours from the time the permittee becomes aware of the circumstances:

   a. Any noncompliance which may endanger health or the environment;

   b. Any unanticipated bypass which exceeds any effluent limitation in the permit (See *Part III.G, Bypass of Treatment Facilities.)*;

   c. Any upset which exceeds any effluent limitation in the permit (See *Part III.H, Upset Conditions*.); or,

   d. Violation of a maximum daily discharge limitation for any of the pollutants listed in the permit.

3. A written submission shall also be provided within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:

   a. A description of the noncompliance and its cause;

b. The period of noncompliance, including exact dates and times;

c. The estimated time noncompliance is expected to continue if it has not been corrected; and,

d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

e. Steps taken, if any, to mitigate the adverse impacts on the environment and human health during the noncompliance period.

4. The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the Division of Water Quality, (801) 536-4300.

5. Reports shall be submitted to the addresses in *Part II.D*, *Reporting of Monitoring Results*.

J. Other Noncompliance Reporting. Instances of noncompliance not required to be reported within 24 hours shall be reported at the time that monitoring reports for *Part II.D* are submitted. The reports shall contain the information listed in *Part II.I.3*.

K. Inspection and Entry. The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and,

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the *Act*, any substances or parameters at any location.

III COMPLIANCE RESPONSIBILITIES

A. Duty to Comply. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

B. Penalties for Violations of Permit Conditions. The *Act* provides that any person who violates a permit condition implementing provisions of the *Act* is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates permit conditions of the Act is subject to a fine not exceeding $25,000 per day of violation; Any person convicted under *UCA 19-5-115(2)* a second time shall be punished by a fine not exceeding $50,000 per day. Except as provided at *Part III.G, Bypass of Treatment Facilities* and *Part III.H, Upset Conditions*, and possibly *Part I.D.12, Storm Exemptions* nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.

C. Need to Halt or Reduce Activity not a Defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper Operation and Maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

F. Removed Substances. Collected screening, grit, solids, sludges, or other pollutants removed in the course of treatment shall be buried or disposed of in such a manner so as to prevent any pollutant from entering any waters of the state or creating a health hazard. Sludge/digester supernatant and filter backwash shall not directly enter either the final effluent or waters of the state by any other direct route.

G. Bypass of Treatment Facilities.

1. *Bypass not exceeding limitations*. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for

essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 2 and 3 of this section. Return of removed substances, as described in *Part III.F*, to the discharge stream shall not be considered a bypass under the provisions of this paragraph.

2. *Notice*:

   a. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten (10) days before the date of the bypass.

   b. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required under *Part II.I, Twenty-four Hour Reporting*.

3. *Prohibition of bypass*.

   a. Bypass is prohibited and the Director may take enforcement action against a permittee for a bypass, unless:

      i. The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage ;

      ii. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and,

      iii. The permittee submitted notices as required under paragraph 2 of this section.

   b. The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph 3.a of this section.

H. Upset Conditions.

1. *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of paragraph 2. of this section are met. The Director's administrative determination regarding a claim of upset cannot be judiciously challenged by the permittee until such time as an action is initiated for noncompliance.

2. *Conditions necessary for a demonstration of upset.* A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

    a. An upset occurred and that the permittee can identify the cause(s) of the upset;

    b. The permitted facility was at the time being properly operated;

    c. The permittee submitted notice of the upset as required under *Part II.I, Twenty-four Hour Notice of Noncompliance Reporting*; and,

    d. The permittee complied with any remedial measures required under *Part III.D, Duty to Mitigate.*

3. *Burden of proof.* In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

I. Toxic Pollutants: The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of *The Water Quality Act of 1987* for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

J. Changes in Discharge of Toxic Substances. Notification shall be provided to the Director as soon as the permittee knows of, or has reason to believe:

1. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

    a. One hundred micrograms per liter (100 ug/L);

    b. Two hundred micrograms per liter (200 ug/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/L) for 2,4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;

    c. Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with *UAC R317-8-3.4(7)* or (10); or,

    d. The level established by the Director in accordance with *UAC R317-8-4.2(6).*

2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

a. Five hundred micrograms per liter (500 ug/L);

b. One milligram per liter (1 mg/L) for antimony:

c. Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with *UAC R317-8-3.4(9)*; or,

d. The level established by the Director in accordance with *UAC R317-8-4.2(6)*.

K. Industrial Pretreatment. Any wastewaters discharged to the sanitary sewer, either as a direct discharge or as a hauled waste, are subject to Federal, State and local pretreatment regulations. Pursuant to Section 307 of *The Water Quality Act of 1987*, the permittee shall comply with all applicable federal General Pretreatment Regulations promulgated at *40 CFR 403*, the State Pretreatment Requirements at *UAC R317-8-8*, and any specific local discharge limitations developed by the Publicly Owned Treatment Works (POTW) accepting the wastewaters.

In addition, in accordance with *40 CFR 403.12(p)(1)*, the permittee must notify the POTW, the EPA Regional Waste Management Director, and the State hazardous waste authorities, in writing, if they discharge any substance into a POTW which if otherwise disposed of would be considered a hazardous waste under *40 CFR 261*. This notification must include the name of the hazardous waste, the EPA hazardous waste number, and the type of discharge (continuous or batch).

IV GENERAL REQUIREMENTS

A. Planned Changes. The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when the alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are not subject to effluent limitations in the permit. In addition, if there are any planned substantial changes to the permittee's existing sludge facilities or their manner of operation or to current sludge management practices of storage and disposal, the permittee shall give notice to the Director of any planned changes at least 30 days prior to their implementation.

B. Anticipated Noncompliance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

C. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

D. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee shall apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit.

E. Duty to Provide Information. The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

F. Other Information. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Director, it shall promptly submit such facts or information.

G. Signatory Requirements. All applications, reports or information submitted to the Director shall be signed and certified.

1. All permit applications shall be signed by either a principal executive officer or ranking elected official.

2. All reports required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described above and submitted to the Director, and,

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

3. *Changes to authorization.* If an authorization under paragraph *IV.G.2* is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph *IV.G.2* must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. *Certification.* Any person signing a document under this section shall make the following certification:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. Penalties for Falsification of Reports. The *Act* provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than $10,000.00 per violation, or by imprisonment for not more than six months per violation, or by both.

I. Availability of Reports. Except for data determined to be confidential under *UAC R317-8-3.2*, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of Director. As required by the *Act*, permit applications, permits and effluent data shall not be considered confidential.

J. Oil and Hazardous Substance Liability. Nothing in this permit shall be construed to preclude the permittee of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under the *Act*.

K. Property Rights. The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

L. Severability. The provisions of this permit are severable, and if any provisions of this permit, or the application of any provision of this permit to any circumstance, are held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

M. Transfers. This permit may be automatically transferred to a new permittee if:

1. The current permittee notifies the Director at least 20 days in advance of the proposed transfer date;

2. The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,

3. The Director does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph 2 above.

N. State Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by *UCA 19-5-117*.

O. Water Quality-Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate effluent limitations and compliance schedule, if necessary, if one or more of the following events occurs:

1. Water Quality Standards for the receiving water(s) to which the permittee discharges are modified in such a manner as to require different effluent limits than contained in this permit.

2. A final wasteload allocation is developed and approved by the State and/or EPA for incorporation in this permit.

3. A revision to the current Water Quality Management Plan is approved and adopted which calls for different effluent limitations than contained in this permit.

P. Toxicity Limitation -Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include, whole effluent toxicity (WET) limitations, a compliance date, a compliance schedule, a change in the whole effluent toxicity (biomonitoring) protocol, additional or modified numerical limitations, or any other conditions related to the control of toxicants if one or more of the following events occur;

1. A pattern of toxicity is detected, as per Part I, D.13 of this permit, during the duration of this permit.

2. The TRE results indicate that compliance with the toxic limits will require an implementation schedule past the date for compliance and the Director agrees with the conclusion.

3. The TRE results indicate that the toxicant(s) represent pollutant(s) that may be controlled with specific numerical limits, and the Director agrees that numerical controls are the most appropriate course of action.

4. Following the implementation of numerical control(s) of toxicant(s), the Director agrees that a modified biomonitoring protocol is necessary to compensate for those toxicants that are controlled numerically.

5. The TRE reveals other unique conditions or characteristics which, in the opinion of the Director, justify the incorporation of unanticipated special conditions in the permit.

FACT SHEET STATEMENT OF BASIS
KENNECOTT UTAH COPPER LLC
RENEWAL PERMIT: DISCHARGE, BIOSOLIDS & STORM WATER
UPDES PERMIT NUMBER: UT0000051
UPDES BIOSOLIDS PERMIT NUMBER: UTL-000051
UPDES MULTI-SECTOR STORM WATER GENERAL PERMIT NUMBER: UTR0000000
MAJOR INDUSTRIAL

FACILITY CONTACTS

Contact Name:	Paula H. Doughty	Contact Name:	Brian Vinton
Position:	Manager, Tailings &Water Services	Position:	Principal Advisor, Water Quality
Number:	(801) 204-3501	Number:	(801) 569-7887
Contact Name:	Steve Schnoor	Contact Name:	Reed Bodell
Position:	Manager, Environment	Position:	Superintendant, Environmental Monitoring
Number:	(801) 204-2814	Number:	(801) 569-7915

Facility Name:	Kennecott Utah Copper LLC
Mailing Address:	4700 Daybreak Parkway South Jordan UT 84009

DESCRIPTION OF FACILITY

Kennecott Utah Copper LLC (Kennecott) operates an integrated mining and mineral processing facility that includes an open pit copper mine with some underground development, waste rock disposal areas, water collection system, copper cementation plant, concentrator, smelter, refinery, power plant, reverse osmosis (RO) groundwater treatment plant, sewage treatment plant, and a tailings impoundment. In addition, Kennecott also provides post-closure management of heap leach rinsing and drain down water from Barneys Canyon, an open pit gold mine and processing facility.

The Bingham Canyon Mine open pit has been in operation since about 1904 and typically mines approximately 450,000 to 600,000 tons of ore and waste rock per day. The ore is sent to the Copperton Concentrator and could include up to 200,000 tons of ore per day. Production includes a froth flotation process to produce copper and molybdenum concentrates. Correspondingly, up to 200,000 tons of tailings from the concentrator could be conveyed, at design, to the tailings impoundment per day.

The smelter processes copper concentrate that originates primarily from the Copperton Concentrator and periodically from other mine and mineral processing facilities, along with flux, coolants, and other reagents in order to produce anode copper, sulfuric acid, and rhenium. In the refinery, the anode copper is electrolytically refined to cathode copper. Gold, silver, selenium, lead carbonate, rhenium, platinum, and palladium are also produced at the refinery.

The primary discharge from the tailings impoundment reports directly to the Transitional Waters and Gilbert Bay of Great Salt Lake via Outfall 012. The sediment pond and Outfall 002 remain in place for the discharge of tailings water to the C-7 Ditch as needed. Outfall 007 for the discharge of seepage and dike runoff water from the tailings impoundment to the C-7 Ditch also remains in place.

Waste rock contact water continues to be collected in the water collection system at the base of the waste rock areas. Kennecott recovers copper from certain waste rock contact waters at a facility in Bingham Canyon that currently uses copper cementation technology. De-copperized water and waste rock contact water that bypasses the copper recovery circuit is introduced into the tailings line for management and is then discharged to the tailings impoundment.

Groundwater in the alluvial aquifer in the southwest portion of the Salt Lake Valley has been contaminated by historic leach-water management practices. Groundwater cleanup of the Zone A plume is being conducted under a Consent Decree between EPA, State of Utah, and Kennecott, and involves extraction of low pH groundwater from wells and introduction of this water to the tailings line along with waste rock contact water. Under normal operations, excess neutralizing capacity in the tailings line resulting from lime added as a milling reagent and the intrinsic neutralization capacity of the tailings provides adequate treatment of all acidic flows routed to the tailings line. During upsets or other disruptions of normal operation, such as planned or unplanned shutdowns, Kennecott may add lime directly to the tailings line to neutralize the acidic flows.

Kennecott also extracts neutral water with elevated sulfate concentrations from the leading edge of the Zone A plume and treats this water using RO membrane treatment to produce drinking water. Drinking water is provided to the public through the Jordan Valley Water Conservancy District (JVWCD) in partial fulfillment of a settlement with the State of Utah under a Natural Resource Damage claim. RO treatment produces a concentrate wastewater which reports to the tailings line. JVWCD has constructed a separate RO treatment plant to treat other historic mine contaminated groundwater (Zone B plume). This facility is permitted to discharge to the Transitional Waters and Gilbert Bay of Great Salt Lake via a 21 mile pipeline under UPDES Permit No. UT0025836.

Near the smelter and refinery, Kennecott captures spring water and artesian groundwater flows and pumps groundwater wells where groundwater is impacted by historic releases of selenium and arsenic. This groundwater is utilized in Kennecott's process water system. Kennecott undertakes these groundwater management activities pursuant to a Record of Decision issued by EPA and the State of Utah and a pending Consent Decree.

Effluent from the sewage treatment plant (STP) adjacent to the Refinery is piped directly to Pump Station No. 4 and is incorporated into the process water circuit. Pump Station No. 4 directs flow to the Magna Reservoir where it is mixed with recycle water from the tailings impoundment and smelter. Water from the Magna Reservoir is pumped to the Copperton Concentrator where it is used for mineral beneficiation. UPDES effluent limitations for the STP are not required because Kennecott is not authorized to discharge the effluent to waters of the state. Instead, effluent is directly recycled into the process water system.

The Barneys Canyon Mine is located approximately 4 miles north of the Bingham Canyon Pit and about 1.5 miles northwest of the Copperton Concentrator. Five open pits were constructed between 1989 and 2001. Waste rock disposal area reclamation was completed in 2002. Operations included gold extraction by cyanide heap-leach methods with a closed loop process water system. Five leach pads were constructed and operated through 2013. Meteoric water drainage from the heaps is now directed to Kennecott's process water system. Flows from the Barneys Canyon Water Tunnel, located adjacent to one of the mine pits, are piped to the Copperton Concentrator and used in the beneficiation circuit or directed to the tailings lines. Seep and spring water adjacent to waste rock and the leach pads are also routed directly to the tailings lines.

Kennecott's Utah Power Plant discharges approximately 300 gpm from the ash-sluicing system to the tailings line discharging to the tailings impoundment.

FACILITY

The Bingham Canyon Mine and Water Collection System, Copperton Concentrator, Barneys Canyon Mine, Utah Power Plant, Tailings Impoundment, Copper Cementation Plant, RO plant, Sewage Treatment Plant, Smelter, Refinery, and associated facilities for each of these operational units.

FACILITY LOCATION

The company's active facilities are located in western Salt Lake County. The Bingham Canyon Mine, Water Collection System, Copper Cementation Plant, RO Plant, Barneys Canyon and Copperton Concentrator are located near Copperton, Utah. The Tailings Impoundment, Power Plant, Sewage Treatment Plant, Smelter and Refinery are located near Magna, Utah. A combination of concentrate, tailing pipelines, and process water return pipeline connect the Copperton Concentrator with the Tailings Impoundment, and the Smelter.

STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODE

The SIC codes are 1021 copper ore mining and milling and 3331 smelting and refining of copper.

DESCRIPTION OF THE PROCESS AND WASTEWATER SYSTEMS

Mine and waste rock contact waters at the Bingham Canyon Mine are collected and managed through a water collection system, the Large Bingham Reservoir, the Small Bingham Reservoir, and various groundwater extraction wells from remediation activities.

The Bingham Canyon Mine water collection system consists of a series of cutoff walls, collection basins, pipes, toe drains, French drains and lined canals that collect and transport storm water runoff from waste rock. Contact waters from certain sections of the waste rock piles are piped to the copper cementation plant for copper recovery. Tailwater from the copper cementation plant and other waste rock contact waters are typically delivered directly to the tailings line; these waters can also be diverted into the three compartment Large Bingham Reservoirs or Small Bingham Reservoir for temporary storage and later pumped to the tailings line. These reservoirs may also be used to store low-pH mine and waste rock contact waters, certain mine tunnel flows and water from various extraction wells, including the Bingham Canyon Alluvial well, Lark Shaft, Bingham Creek cutoff wall, Curtis Spring, the acid plume wells and the Copperton channel well.

Kennecott has permanently discontinued use of Outfall 005, originally approved in 1984 for storm water and mine drainage discharge to the Jordan River.

Water is collected and used at the Copperton Concentrator and consists of water collected from tunnels, storm water runoff, extraction well water and meteoric flows from the mine. Sources of water collected and used at the Copperton Concentrator include:

- Tailings return water (including smelter process water)
- Bingham Canyon mine pit water
- Carr Fork Shaft (Tooele County)
- Storm water from the Upper Bingham Canyon drainages surrounding the pit
- Water from the North Ore Shoot (NOS) Shaft
- Water pumped from the Carr Fork underground workings
- Bingham Tunnel water
- Water from deep wells B2G1193, BFG1200, BSG2828 and LTG1147
- Water from the Lark Clean Water Well
- Water from the Lark Shaft
- Water from the upper Dry Fork clean water well and Mid-Valley clean water well
- Treated sewage effluent water
- Barneys Canyon mine pit drainage water, heap leach drain down water and some meteoric contact water
- Permeate and/or concentrate streams from membrane treatment (RO) facilities, associated with the treatment of contaminated groundwater
- Leachate collection system water (if present) from Arthur Stepback Repository (CERCLA CAMU)
- Mine and waste rock contact waters
- Canal water (e.g., Utah and Salt Lake Canal or Jordan Canal) for use in processing
- Other mine impacted surface waters or ground waters

Water from the NOS, Carr Fork Shaft, upper Dry Fork clean water well, Mid-Valley clean water well, Bingham Tunnel, Lark Well and Lark Shaft can be routed into the process water reservoir or into the Moly filter water tank. Other waters that are routed into the process water reservoir include overflow from the tailings thickeners and overflow from the clarifier. Mine water is commingled with Copperton Concentrator tailings and piped 13 miles to the tailings impoundment.

Deep wells provide feed water to the Zone A RO plant. Treated water from this plant is delivered to a municipal drinking water purveyor for distribution to the public; RO concentrate reports to the tailings pipeline. On occasion, treated or untreated water from these wells may be directed to the process water system.

The volume of water that may be discharged from the impoundment is consistent with the volume that could have been discharged prior to commingling with any zero discharge water and includes that volume of water incorporated into Kennecott's process system that is not necessary for process and could have been discharged prior to its integrated management.

Flows to the tailings impoundment include water associated with the Copperton tailings, Smelter Slag Concentrator, Smelter Hydrometallurgical Plant, and the Utah Power Plant. Each of these facilities uses reagents specific for the process requirements. In addition, surface water drainage, flows from the Garfield Wells, Well #10, Adamson Springs and the Riter-North Jordan Canal or the Utah-Salt Lake canal may be diverted into the Tailings water management system as needed to provide freshening or make-up water.

Under normal operating conditions, water is pumped from the tailings impoundment decant pond to a clarification canal and recycled back to the concentrator via the Magna Reservoir. Excess tailings decant water is discharged in accordance with UPDES conditions at the primary discharge point Outfall 012. Water reporting to Outfall 012 is

pumped from the tailings impoundment via the floating decant barge pumps. The intake to these pumps has been designed to skim water from just below the surface in order to reduce the potential to suspend solids from the bottom of the decant pond.

A toe ditch has been constructed along the outer north perimeter of the tailings impoundment embankment with a central toe ditch retention pond. Outfall 007 can be used to discharge from the toe ditch retention pond to the C-7 Ditch when Kennecott does not recycle this water for reuse in the concentrator.

Leachate and stormwater collected from the Arthur Step-back Repository is occasionally pumped to Pump Station No. 4. Located on the southwest corner of the tailings impoundment, this lined repository provides permanent storage for soil and debris cleaned up during remediation activities.

The smelter has implemented a water management system that incorporates separate systems for smelter process water, acid plant blow down, slag mill effluent, hydrometallurgical plant effluent, storm water associated with industrial activity, and storm water not associated with industrial areas.

Smelter process water, such as granulation, anode casting, furnace jacket cooling, acid plant cooling, slag pot cooling, and powerhouse are cooled using onsite cooling towers or heat exchangers or air cooled before returning to the process within the smelter for reuse or sent to the lined East and West Process Ponds before pumping to the Copperton Concentrator via Pump Station No. 4 for recycling. Additional process water includes contact waters used to move process materials within the smelter process. Operations at the smelter are designed to reuse process water within the smelter, or recycle to Copperton Concentrator, thereby meeting the zero discharge effluent limitation.

A hydrometallurgical plant uses the acid plant blow down and related acidic water from the smelter gas cleaning area to process solids from the flash smelter furnace electrostatic precipitator to recover copper and precious metals. In addition, refinery bleed electrolyte, precious metals plant blow down, and miscellaneous bleed streams are directed to the hydrometallurgical plant for use as a reagent. Gypsum/water slurry from this plant is routed through internal Outfall 104 to the tailings impoundment via the slag concentrator tailings pump system. This flow, from the hydrometallurgical plant, is regulated under the effluent guidelines applicable to acid plant blow down and refinery spent electrolyte with appropriate mass based limitations. The volume of effluent from the hydrometallurgical plant is monitored using an inline flow meter. Flow data is used both to calculate the mass effluent limitations using concentration data from Outfalls 002, 007, and 012 to account for the discharge of an equivalent volume of treated tailings water through Outfalls 002, 007 and/or 012.

The STP was constructed to treat sewage from the north end facilities, which include the smelter, refinery, Praxair, Power Plant, railroad support and tailings impoundment support facilities as well as neutralized laboratory wastes from the process and environmental laboratories. The plant includes flow equalization, chlorination, and aerobic digestion of sludge. Discharges from the STP consist of a clarified and chlorinated effluent, which reports directly to Pump Station No. 4 and from there to the concentrators for use as process water. Biosolids produced at the Kennecott STP are transported to a bagging and drying facility on site. The solids are dried and analyzed for heavy metals, to be disposed of annually at the Kennecott permitted solid waste facility on site.
Water from the Tooele, Section 17, Japanese Springs, and noncontact storm water can be discharged at Outfall 004, Outfall 008 or report to the process water return system via the Hazelton Pump and Smelter Return Canal. Surface water flows from wetlands, Jones, Spitz, No-name and other natural springs and other artesian groundwater flows can be discharged directly through Outfall 008 consistent with applicable discharge limitations or report to the process water return system via the Smelter Return Canal.

SUMMARY OF CHANGES FROM PREVIOUS PERMIT

Outfall 005 has been removed from service and is not included in this renewal permit.

The renewal permit includes a Se load limit, chronic WET testing, and various Biota Se analyses to be used as an indicator of compliance with the Narrative Standards for Outfall 012.

Effluent flow limits have been included for all outfalls in the renewal permit. The previous permit did not include effluent flow limits.

Effluent limits for Outfalls 002, 007, 010, and 011 have changed due to the WLA's developed to protect downstream beneficial uses and the implementation of effluent flow limits.

Biosolids permitting requirements have been added to cover the disposal of solids from Kennecott's STP.

DISCHARGE

DESCRIPTION OF DISCHARGE

Kennecott has been reporting self-monitoring results on Discharge Monitoring Reports on a monthly basis, and has maintained a good compliance record with its UPDES permit requirements. Additional information on the compliance record for the facility can be found here: http://echo.epa.gov/effluent-charts#UT0000051

RECEIVING WATERS AND STREAM CLASSIFICATION

The primary receiving water for the tailings impoundment discharge is the Transitional Waters and Gilbert Bay of Great Salt Lake. Collected spring water, and occasional tailings impoundment discharges, flow into the C-7 Ditch which flows into the Lee Creek drainage and from there to Great Salt Lake. Inactive mine tunnels discharge to Butterfield Creek and an ephemeral drainage in Pine Canyon.

Gilbert Bay of Great Salt Lake is classified a Class 5A. The Transitional Waters along the Shoreline of Great Salt Lake are classified as 5E. The C-7 Ditch is classified a Class 3E. Butterfield Creek is classified a Class 2B, 3D and 4. Pine Canyon Creek and Lee Creek are not specifically classified and are presumptively classified as Class 2B and 3D (R317-2-13.13).

Class 2B	Protected for secondary contact recreation such as boating, wading, or similar uses.
Class 3D	Protected for waterfowl, shore birds and other water oriented wildlife not included in Class 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.
Class 3E	Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.
Class 4	Protected for agricultural uses including irrigation of crops and stock watering.
Class 5A	Great Salt Lake – Gilbert Bay. Protected for frequent primary and secondary contact recreation, waterfowl, shore birds and other water oriented wildlife including their necessary food chain.
Class 5E	Great Salt Lake – Transitional Waters. Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

BASIS FOR EFFLUENT LIMITATIONS

The Kennecott operations are covered by USEPA Effluent Guidelines for the Ore Mining and Dressing Point Source Category, the Nonferrous Metals Manufacturing Point Source Category, Utah Secondary Treatment Standards, and Utah Water Quality Standards.

OUTFALL 002, 007, AND 012 TAILINGS IMPOUNDMENT

The flows from the mines and concentrator are usually greater than 90 percent of the flow to the tailings impoundment. Federal Ore Mining Guidelines for these categories of wastewaters have concentration based limitations. The State has concluded and EPA Region VIII has concurred that concentration limits are appropriate for the discharge of this water from the tailings impoundment because the applicable standards and limitations are expressed in terms of concentration or other units of measurements (with the exception of selenium, limited as further described below). A small amount of discharge to the tailings impoundment is from the hydrometallurgical plant. The flow to the hydrometallurgical plant is from the smelter acid plant, refinery bleed electrolyte, precious metals plant blowdown, and related refinery minor bleed streams. Federal Nonferrous Metals Manufacturing Guidelines for these categories of wastewaters have mass based limitations. The effluent from the hydrometallurgical plant to the tailings impoundment is mass based and calculated using the flow of this stream to the tailings impoundment and the concentration of applicable constituents in the discharge from the tailings impoundment.

The appropriate Ore Mining Effluent Guideline limitations in 40 CFR 440.102, best practicable technology (BPT), and 40 CFR 440.103, best available technology (BAT), for copper, lead, gold, silver and molybdenum ores for copper or molybdenum froth flotation are listed in Table 1.

TABLE 1 – ORE MINING EFFLUENT GUIDELINES

Parameter	Effluent Limitations			Units
	Monthly Average	Daily Minimum	Daily Maximum	
Total Suspended Solids (TSS)	20	NA	30	mg/L
Copper (Cu)	0.15	NA	0.30	mg/L
Zinc (Zn)	0.5	NA	1.0	mg/L
Lead (Pb)	0.3	NA	0.6	mg/L
Mercury (Hg)	0.001	NA	0.002	mg/L
Cadmium (Cd)	0.05	NA	0.10	mg/L
pH	NA	6.0	9.0	SU

NA – Not Applicable

For Outfalls 002 and 007, the effluent flow limit is based upon operational history, or estimated by the permittee, utilizing the structural capacities, coupled with operational knowledge. Limitations for TSS and the daily max for Hg are based on the Ore Mining Effluent Guidelines. The limitations for As, Cd, Cu, Cyanide, and Pb, are based on the Wasteload Analysis (WLA). The Hg and Zn daily max limitations are based upon the value in the previous permit, as it is more stringent. The US Army Corps of Engineers 404 Permit for the North Expansion contained a selenium limit of 12 ug/L in lower Lee Creek water north of I-80 that is protective of wildlife at the Inland Sea Shorebird Reserve (ISSR). Accordingly, Kennecott has been required to manage discharge from Outfalls 002 and 007 consistent with meeting the historic 404 permit limit for selenium in this water; that requirement has been retained. From the point of discharge to Lee Creek the additional dilutions provided from other sources prior to discharging into Lee Creek were modeled using the available data. Kennecott may elect to conduct additional hydrologic studies to further refine future WLAs.

The pH is limited by the Utah Secondary Standards, Utah Administrative Code (UAC) Section R317-1-3.2 to a range of 6.5 - 9.0 standard units. The oil and grease limitation of 10 mg/L maximum is based on Best Professional Judgment(BPJ).

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 002 a/						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	50.0	NA	NA	Continuous	Recorder	MGD
TSS	20	30	NA	3 X Weekly	Composite	mg/L
Total As	0.181	0.378	NA	3 X Weekly	Composite	mg/L
Total Cd	0.00079	0.0097	NA	3 X Weekly	Composite	mg/L
Total Cu	0.036	0.057	NA	3 X Weekly	Composite	mg/L
Total Pb	0.0223	0.532	NA	3 X Weekly	Composite	mg/L
Total Hg	0.000013	0.0020	NA	3 X Weekly	Composite	mg/L
Total Zn	0.224	0.431	NA	3 X Weekly	Composite	mg/L
Total Se b/c/	0.012	NA	NA	Monthly	Grab	mg/L
Total Cyanide	0.0056	0.0241	NA	Monthly	Composite	mg/L
Total Dissolved Solids (TDS)	NA	NA	NA	Monthly	Composite	mg/L
Oil and Grease	NA	10	NA	d/	Grab	mg/L
pH	NA	9.0	6.5	3 X Weekly	Grab	SU

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 007 a/						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	15.0	NA	NA	Continuous	Recorder	MGD
TSS	20	30	NA	3 X Weekly	Composite	mg/L
Total As	0.25	0.465	NA	3 X Weekly	Composite	mg/L
Total Cd	0.00089	0.0119	NA	3 X Weekly	Composite	mg/L
Total Cu	0.0492	0.0692	NA	3 X Weekly	Composite	mg/L
Total Pb	0.031	0.660	NA	3 X Weekly	Composite	mg/L
Total Hg	0.000015	0.002	NA	3 X Weekly	Composite	mg/L
Total Zn	0.224	0.50	NA	3 X Weekly	Composite	mg/L
Total Se b/c/	0.012	NA	NA	Monthly	Grab	mg/L
Total Cyanide	0.0065	0.0291	NA	Monthly	Composite	mg/L
Total Dissolved Solids (TDS)	NA	NA	NA	Monthly	Composite	mg/L
Oil and Grease	NA	10	NA	d/	Grab	mg/L
pH	NA	9.0	6.5	3 X Weekly	Grab	SU

a/ Samples collected in compliance with the monitoring requirements specified above shall be collected at the outfall to the C-7 ditch prior to mixing with the receiving water.

b/ 0.012 mg/L is consistent with the requirements of the former U.S. Army Corps of

Engineers 404 Permit #199450301 and applies at the Lower Lee Creek location north of Interstate 80 during a discharge from outfalls 002 and 007.

c/ Selenium will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.

d/ Oil and grease will be sampled when sheen is observed.

For Outfall 012, at the Division's request, Kennecott provided supplemental information in support of its permit renewal application. The information was evaluated to: 1) document that the effluent will not violate water quality standards, and 2) determine if water quality-based effluent limits are required for the permit. Water quality-based effluent limits are required when the effluent has "reasonable potential" to cause or contribute to a violation of a water quality standard. The standard may be a numeric criterion or the Narrative Standards (UAC R317-2-7.2). Final permit limits are the lower of water quality-based effluent limits or technology-based effluent limits such as secondary treatment standards or categorical limits. A detailed analysis of this screening process is included in appendix 1, and is titled "*Memorandum for Rio Tinto Kennecott Copper 2015 Permit Renewal Fact Sheet Statement of Basis, Use support evaluation for Outfall 012-A to Gilbert Bay, Great Salt Lake*", May 17, 2016.

The effluent flow limit is based upon the maximum annual volume discharged historically from Outfall 012, of 19,850 acre-feet per year or 6468 Million Gallons a year.

The pH is limited by the Utah Secondary Standards, Utah Administrative Code (UAC) Section R317-1-3.2 to a range of 6.5 - 9.0 standard units. The oil and grease limitation of 10 mg/L maximum is based on Best Professional Judgment (BPJ). The limitations for As, Zn and total Cyanide are the same as the values in the previous permit. The limitations for Cd, Cu, Pb, and Hg are based upon 40 CFR 440. The concentration and load limits for Se are based upon BPJ to prevent egg concentrations in affected birds from exceeding 12.5 mg/kg because there are no water column standards for selenium for Gilbert Bay or the Transitional Waters. The 12.5 mg/kg selenium tissue-based standard for Gilbert Bay is based upon R317-2-14 and is also being applied to the Transitional Waters to demonstrate compliance with the Narrative Standards.

	Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 012 a/						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Annual Max	Frequency	Sample Type	Units
Flow	NA	NA	NA	6468	Continuous	Recorder	MG b/
TSS	20	30	NA	NA	Daily	Composite	mg/L
Total As	0.25	0.50	NA	NA	Daily	Composite	mg/L
Total Cd	0.05	0.10	NA	NA	Daily	Composite	mg/L
Total Cu	0.15	0.30	NA	NA	Daily	Composite	mg/L
Total Pb	0.30	0.60	NA	NA	Daily	Composite	mg/L
Total Hg e/	0.001	0.002	NA	NA	Monthly	Grab	mg/L
Total Zn	0.224	0.50	NA	NA	Daily	Composite	mg/L
Total Se c/	NA	0.054	NA	NA	Daily	Composite	mg/L
Total Se, load	NA	NA	NA	900	Monthly	Calculated	Kg
Total Cyanide	0.1	0.2	NA	NA	Monthly	Composite	mg/L
Selenium	NA	NA	NA	NA	Annually	See Section I.D.10. Of permit UT0000051	
TDS	NA	NA	NA	NA	Monthly	Composite	mg/L
Oil and Grease	NA	10	NA	NA	d/	Grab	mg/L
pH	NA	9.0	6.5	NA	Daily	Grab	SU
WET Acute Biomonitoring	NA	LC_{50} > 100% Effluent	NA	NA	Quarterly	Composite	NA
WET Chronic Biomonitoring	NA	$TU_c \leq 1.6$ /f	NA	NA	Quarterly	Composite	NA

There shall be no untreated sanitary wastewater discharged into the tailings impoundment.

There shall be no floating solids or visible foam in other than trace amounts.

N.A. - Not Applicable.

See Definitions, *Part I.A* for definition of terms.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the outfall to the Great Salt Lake prior to mixing with the receiving water.

a/ Annual Discharge will be limited annually to 6468 Million Gallons a year (19,850 acre feet/year).

b/ Million Gallons

c/ Selenium in effluent will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.

d/ Oil and grease will be sampled when sheen is observed.

e/ The mercury analytical method must be EPA Method 1631 used on grab samples collected from the tailings impoundment barge

f/ TUc is calculated by dividing the receiving water effluent concentration determined in accordance with R317-2-5 by the chronic test IC_{25}. The TUc is an indicator and an exceedance is not used for determining compliance.

Tailings Impoundment Storm Exemption

The current permit allows a storm exemption for the tailings impoundment when there is a pool volume equal to the 10-year, 24-hour storm plus a volume equal to the 24-hour accumulation of process water. Recycle of tailings water to the concentrator, maintaining treatment, and minimizing the amount of overflow is required. For storm events, the USEPA storm exemption requirements of 40 CFR 440.131(b) for facilities allowed to discharge will apply. Since issuance of the 2001 permit renewal, Kennecott completed its active operational transition from the South to the North Tailings Impoundment. The updated pool volume required for storm exemption is calculated below:

North Impoundment

Source	Acre Feet
Normal Pool Volume	5500-9000
Mine Storm Water at 10,000 gpm	44
Mine Water at 2,000 gpm	9
Concentrator process water discharge at 45,000 gpm	133
Hydrometallurgical Plant, Slag Tailings water at 2,000 gpm	9
Power Plant Ash Sluice at 300 gpm	2
Direct precipitation (1017 acres) x (2 inches) x (1 foot/12 inches)	170
Tailings Impoundment/Embankment surface area 3294 acres	
Runoff from 10-year, 24-hour storm (2.0 inches), Runoff Coefficient (0.3)	
Runoff (3666 acres) x (2 inches) x (1 foot/12 inches) (.3)	183
Total Capacity in acre-feet to Qualify for Storm Exemption	6050-9550*

*Dependent on Actual Pool Volume prior to storm event

Information that must be submitted as part of the storm exemption includes the appropriate tailings impoundment/embankment surface area and pool area, amount of precipitation or snowmelt at the tailings impoundment and/or mine, decant pool volume prior to the discharge, effluent concentrations, concentrator flow rate to the tailings impoundment, return flow from the tailings impoundment to the concentrators via Pump Station No. 1, and other steps taken to maintain treatment and minimize the amount of overflow such as maintaining the pH in the range of 6.5 to 9.0 in the tailings impoundment to minimize metals in the discharge.

Transitional Waters Monitoring Program

As specified in the *Memorandum for Kennecott Utah Copper LLC 2015 Permit Renewal Fact Sheet Statement of Basis, Use Support Evaluation for Outfall 012 to Gilbert Bay, Great Salt Lake*, this permit includes a new monitoring requirement for water, sediment, invertebrates, and bird eggs (if available) in the vicinity of the outfall delta and collocated water and brine shrimp (if available) in the open waters to address the uncertainties regarding reasonable potential for Se. As the data gaps and geographical locations are the same as identified for JVWCD, this permit includes the same Joint Discharge Area Transitional Monitoring Program requirements and implementation triggers for interpreting the egg data.

Kennecott is required to annually sample eight (8) bird eggs, if available, but not to exceed 20% of available eggs, during the nesting season, April15 through June 30, for the current permit cycle. The eggs will be collected from bird nests in the Jordan Valley 001 and Kennecott 012 affected outfall area. These samples will be subject to the tissue based selenium water quality standard of a geometric mean of at least 5 eggs of 12.5 mg/kg dry weight over the nesting season for Gilbert Bay of Great Salt Lake to demonstrate compliance with the Narrative Standards. Kennecott must notify the Director within 7 business days of becoming aware of any egg concentrations that exceed 9.8 mg/kg. In addition, total mercury concentrations in the egg tissue samples must also be evaluated and reported by Kennecott.

Kennecott is required to annually collect co-located macroinvertebrate, water, and sediment samples once between April 15 and June 30 and as close in time as practical to the bird egg collection. The requirement to sample and analyze sediment may be excluded if the sampling plan is modified and approved by the Director. Reasons for not sampling sediment include that the data does not provide information for evaluating the support of the uses in the Transitional Waters or that these resources are being reallocated to collect higher priority data. The sampling plan will document the rationale. All samples will be analyzed for selenium. Biota and sediment will also be analyzed for total mercury. Water samples will be analyzed for methyl and total mercury and total dissolved solids or salinity. The co-located macroinvertebrates, sediment and water samples will be collected at up to six (6) evenly spaced locations along the discharge watercourse from the discharge point to the water's edge from where Outfall 012 enters standing waters of the Great Salt Lake. This monitoring will be consistent with the February, 2011 Field Sampling Plan Outfall 001 at Great Salt Lake, Southwest Groundwater Treatment Plant, unless modifications are approved in writing by the Director.

Kennecott is required to biannually collect co-located brine shrimp and water samples twice per year from the open waters of Gilbert Bay in the vicinity of the outfall. Sample collection is constrained by brine shrimp dynamics in the sampling area as brine shrimp may not always be present when sampling is attempted. The intent is to collect brine shrimp samples as close as available to where the effluent waters enter Gilbert Bay between April 15 and June 30 and in October. The water sample will be analyzed for total and methyl mercury and selenium. The brine shrimp sample will be analyzed for total mercury and selenium. The open water monitoring will be consistent with the methods described in the 2015 Bi-annual Sampling Results prepared for Jordan Valley Water Conservancy District by CH2M unless modifications are approved in writing by the Director.

Kennecott will conduct annual bird surveys approximately every two weeks between April 15 and June 30 (four times per season) to document bird abundance, diversity, and use of the Outfall 012 mud flat habitat, particularly for evidence of feeding and nesting using methodology approved by the Director. This data will be submitted in the Annual Report.

DWQ strongly recommends that Kennecott coordinate monitoring efforts with other facilities that discharge in the same delta to avoid needless duplication and further impact to avian wildlife in the delta area. Other monitoring requirements may be shared if appropriate. The Director shall be notified as soon as possible, but no later than April 1, if the efforts to coordinate monitoring with other dischargers to the delta area are unsuccessful. The detailed field and laboratory data, analysis and a summary of the results from the bird surveys, egg samples and co-located water, sediment and macroinvertibrates' monitoring must be submitted to the DWQ by February 1, or another agreed upon date, following the end of the calendar year for which the results were obtained.

OUTFALL 104 SMELTER AND REFINERY DISCHARGE

The discharges from the refinery and smelter are regulated by USEPA Nonferrous Metals Manufacturing Metallurgical Acid Plant, and Spent Refinery Electrolyte point source categories. USEPA regulations require no direct discharge of smelter process wastewater but discharge is allowed from the acid plant. The acid plant is designed to produce 7.7 x 10^6 lbs/day of H_2SO_4. The Refinery is designed to produce 2.0 x 10^6 lbs/day average cathode production. The limitations for the smelter acid plant and refinery are mass limitations.

The gypsum/water slurry effluent from the hydrometallurgical plant is regulated by the mass limitations for metallurgical acid plants and spent refinery electrolyte. Refinery casting is not included in the determination of applicable effluent limits after completion of the 1995 smelter, because the refinery casting has been moved to the smelter casting area and there is zero discharge from this area.

The smelter is regulated under new source performance standards (NSPS). Table 2 contains NSPS for the smelter acid plant and hydrometallurgical plant effluents and Table 3 contains the smelter acid plant and hydrometallurgical plant mass discharge limits.

TABLE 2
Smelter Acid Plant and Hydrometallurgical Plant Mass Discharge Guidelines 40 CFR 421.94

Parameter	Effluent Limitations	
	Monthly Maximum lbs/10^6 lbs H_2SO_4	Daily Maximum lbs/10^6 lbs H_2SO_4
TSS	30.650	38.310
As	1.456	3.550
Cd	0.204	0.511
Cu	1.558	3.269
Pb	0.332	0.715
Zn	1.073	2.605
pH	(1)	(1)

TABLE 3
Smelter Acid Plant and Hydrometallurgical Plant Mass Discharge Guidelines 40 CFR 421.94

Parameter	Effluent Limitations (Based on H_2SO_4 production of 7.7 X 10^6 lbs/day)	
	Monthly Maximum lbs/day	Daily Maximum lbs/day
TSS	236	295
As	11.2	27.3
Cd	1.57	3.93
Cu	12.0	25.2
Pb	2.56	5.51
Zn	8.26	20.1
pH	(1)	(1)

(1) The pH is limited by the Utah Secondary Standards, Utah Administrative Code (UAC) Section R317-1-3.2 to a range of 6.5 - 9.0 standard units.

Small flows of spent refinery electrolyte are subject to the Spent Refinery Electrolyte effluent limitation guidelines. Table 4 contains the effluent limitation guidelines for the refinery spent electrolyte effluent and Table 5 contains the refinery mass discharge limits.

TABLE 4 Refinery Spent Electrolyte Guidelines 40 CFR 421.54		
Parameter	Effluent Limitations	
	Monthly Maximum lbs/10^6 lbs Cu produced	Daily Maximum lbs/10^6 lbs H_2SO_4
TSS	0.588	0.735
As	0.0281 (2)	0.068
Cu	0.030	0.063
Ni	0.018	0.027
pH	(1)	(1)

TABLE 5 Refinery spent Electrolyte Mass Discharge Limits		
Parameter	Effluent Limitations (Based on Cu cathode production of 2.0 X 10^6 lbs/day)	
	Monthly Maximum lbs/day	Daily Maximum lbs/day
TSS	1.18	1.47
As	0.06	0.14
Cu	0.060	0.13
Ni	0.04	0.054
pH	(1)	(1)

(1) The pH is limited by the Utah Secondary Standards, Utah Administrative Code (UAC) Section R317-1-3.2 to a range of 6.5 - 9.0 standard units.

(2) The Arsenic number differs from the effluent limitation guidelines in that it is more stringent and is continued from a previous permit consistent with the anti-backsliding provision of the CWA.

In order to calculate the allowable discharge limits from Outfall 104, DWQ added the values in Tables 3 and 5 to produce total mass limits in Table 6 applicable to the smelter acid plant, hydrometallurgical plant, and refinery discharge. The discharge is directed to the tailings impoundment where further treatment through precipitation, sedimentation, and clarification occurs in the tailings impoundment decant pond to meet the mass limitations, especially for total suspended solids. Compliance with mass limitations is calculated by first multiplying the flow from the hydrometallurgical plant by the ratio of tailings impoundment wastewater discharge rate divided by the total wastewater inflow to the tailings impoundment to determine the portion attributable to the hydrometallurgical plant. Finally, this discharge flow rate is multiplied by the tailings impoundment discharge concentrations to determine the mass discharged.

TABLE 6 Smelter Acid Plant/Hydrometallurgical Plant/Refinery Mass Discharge Limits Outfall 104		
Parameter	Effluent Limitations	
	Monthly Maximum lbs/day	Daily Maximum lbs/day
TSS	237	296
As	11.3	27.4
Cd	1.57	3.93
Cu	12.1	25.3
Pb	2.56	5.51
Zn	8.26	20.1

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 104					
Parameter	Discharge Limitations a/		Monitoring Requirements		Units
	Maximum Monthly Average	Daily Maximum	Frequency	Sample Type	
Flow	NA	NA	Continuous	Recorder	MGD
TSS	237	296	Weekly	Composite	lb/day
Total As	11.3	27.4	Weekly	Composite	lb/day
Total Cd	1.57	3.93	Weekly	Composite	lb/day
Total Cu	12.1	25.3	Weekly	Composite	lb/day
Total Pb	2.56	5.51	Weekly	Composite	lb/day
Total Zn	8.26	20.1	Weekly	Composite	lb/day

a/ See definitions Part I.A. for definition of terms

OUTFALL 004 RUNOFF AND ARTESIAN WATER

Storm water runoff from the drainage behind the smelter through the Kessler drainage channel, the flow from Japanese Springs, excess water from Tooele Spring, surface flows, natural springs and excess Section 17 water which has not been used for process can be discharged at relocated Outfall 004. The discharge will be sampled and reported for the same parameters as Outfall 008. Discharges from outfall 004 are not limited on flow, but will be monitored and reported if a discharge occurs.

OUTFALL 008

Outfall 008 consists of water from the Garfield Wells, Section 17, surface flows, Tooele Spring, Jones Spring, Spitz Spring, No-name Spring and other natural springs. Surface water and artesian groundwater with elevated selenium levels will continue to be contained and routed to the process water circuit for treatment and use at the Copperton Concentrator. However, surface water or artesian groundwater meeting discharge limitations can also be discharged through Outfall 008. The discharge is monitored quarterly for the same parameters as Outfall 012 except for cyanide and biomonitoring.

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 008						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	5.5	NA	NA	Quarterly	Measured	MGD
TSS	20	30	NA	Quarterly	Grab	mg/L
Total As	0.25	0.50	NA	Quarterly	Grab	mg/L
Total Cd	0.05	0.10	NA	Quarterly	Grab	mg/L
Total Cu	0.15	0.30	NA	Quarterly	Grab	mg/L
Total Pb	0.30	0.60	NA	Quarterly	Grab	mg/L
Total Hg	0.001	0.002	NA	Quarterly	Grab	mg/L
Total Zn	0.224	0.50	NA	Quarterly	Grab	mg/L
Selenium	NA	0.054	NA	Quarterly	Grab	mg/L
Total Dissolved Solids (TDS)	NA	NA	NA	Quarterly	Grab	mg/L
Oil and Grease	NA	10	NA	a/	Grab	mg/L
pH	NA	9.0	6.5	Quarterly	Grab	SU

a/ When sheen is observed

NA – Not Applicable.

OUTFALL 009 PINE CANYON TUNNEL

Outfall 009 consists of up to 0.086 MGD of water from the Pine Canyon Tunnel, a former mine tunnel still in use by Kennecott for water conveyance. The majority of this water seeps into the ground before it reaches the intermittent stream channel. The discharge will be monitored at the portal of the Pine Canyon Tunnel. The permit limits are the same as in the previous permit. Data from the facility indicate that dissolved solid concentrations after mixing with the intermittent stream are characterized by lower constituent concentrations than documented in storm water in this drainage.

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 009						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	0.086	NA	NA	2 X Yearly	Measured	MGD
TSS	20	30	NA	2 X Yearly	Grab	mg/L
Total As	0.25	0.50	NA	2 X Yearly	Grab	mg/L
Total Cd	0.05	0.10	NA	2 X Yearly	Grab	mg/L
Total Cu	0.15	0.30	NA	2 X Yearly	Grab	mg/L
Total Pb	0.30	0.60	NA	2 X Yearly	Grab	mg/L
Total Hg	0.001	0.002	NA	2 X Yearly	Grab	mg/L
Total Zn	0.224	0.50	NA	2 X Yearly	Grab	mg/L
Selenium b/	0.012	NA	NA	2 X Yearly	Grab	mg/L
Total Dissolved Solids (TDS)	NA	NA	NA	2 X Yearly	Grab	mg/L
Oil and Grease	NA	10	NA	a/	Grab	mg/L
pH	NA	9.0	6.5	2 X Yearly	Grab	SU

a/ Oil and grease will be sampled when sheen is observed.

b/ Selenium will be analyzed by Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.

NA – Not Applicable.

OUTFALL 010 BUTTERFIELD TUNNEL

Outfall 010 consists of water from the Butterfield Tunnel, a former mine. The discharge will be sampled and reported for the same parameters as the tailings impoundment except for cyanide. The discharge limits have been developed to comply with the most restrictive standard from the Ore Mining guidelines 40 CFR 440.103, Class 3D aquatic life, Class 4 agricultural water quality standards, and the waste load analysis developed water quality based effluent limit listed in the following table. The agricultural standard is used as a maximum for total dissolved solids, arsenic and lead because the existing quality is significantly better than the calculated effluent limitations.

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 010						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	0.65	NA	NA	Quarterly	Measured	MGD
TSS	20	30	NA	Quarterly	Grab	mg/L
Total As	NA	0.10	NA	Quarterly	Grab	mg/L
Total Cd	0.0013	0.0066	NA	Quarterly	Grab	mg/L
Total Cu	NA	0.038	NA	Quarterly	Grab	mg/L
Total Fe	NA	1.09	NA	Quarterly	Grab	mg/L
Total Pb	0.023	0.100	NA	Quarterly	Grab	mg/L
Total Hg	0.00002 a/	0.00023	NA	Quarterly	Grab	mg/L
Total Zn	0.323	0.493	NA	Quarterly	Grab	mg/L
Selenium b/	0.005	0.0184	NA	Quarterly	Grab	mg/L
Total Dissolved Solids (TDS)	NA	1200	NA	Quarterly	Grab	mg/L
Oil and Grease	NA	10	NA	c/	Grab	mg/L
pH	NA	9.0	6.5	Quarterly	Grab	SU

a/ Kennecott will voluntarily analyze mercury using a low level total mercury analysis.

b/ Selenium will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.

c/ When sheen is observed

NA – Not Applicable.

OUTFALL 011 ADAMSON SPRING

This discharge is a natural spring. However, there is the potential for relatively small amounts of process water to commingle with the spring water. The discharge will be limited for total suspended solids (TSS), and zinc as listed in the Ore Mining Effluent Guideline limitations in 40 CFR 440.102, best practicable technology (BPT), and 40 CFR 440.103, best available technology (BAT). These limitations are more restrictive than the WLA developed for this permit renewal. The pH is limited by the Utah Secondary Standards, Utah Administrative Code (UAC) Section R317-1-3.2 to a range of 6.5-9.0 standard units. Oil and Grease is limited by Best Professional Judgment to 10 mg/L.

A maximum limitation for arsenic is based upon the ground water permit for this spring. This limit has been included in previous permits, and is more restrictive than the 2016 WLA WQBEL developed for arsenic. Daily Maximum limits for cadmium and lead were retained as they are more restrictive than 2016 WLA for outfall 011. WQBELs for copper and selenium, are based on the 2016 WLA, which was developed for this discharge point, and are also considered protective of downstream uses (R317-2-8) in Lee Creek. From the point of discharge to Lee Creek the additional dilutions provided from other sources prior to discharging into Lee Creek were modeled using the available data. Kennecott may elect to conduct additional hydrologic studies to further refine future WLAs.

Total dissolved solids (TDS) are to be monitored but not limited because the receiving waters are not classified as Class 4 and the salinity influences from the proximity to Great Salt Lake.

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 011 a/						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	3.9	NA	NA	Quarterly	Measured	MGD
TSS	20	30	NA	Quarterly	Grab	mg/L
Total As	NA	0.013	NA	Quarterly	Grab	mg/L
Total Cd	0.0013	0.010	NA	Quarterly	Grab	mg/L
Total Cu	0.102	0.119	NA	Quarterly	Grab	mg/L
Total Pb	0.0662	0.010	NA	Quarterly	Grab	mg/L
Total Zn	0.224	0.50	NA	Quarterly	Grab	mg/L
Selenium b/	0.0058	0.013	NA	Quarterly	Grab	mg/L
Oil and Grease	NA	10	NA	c/	Grab	mg/L
pH	NA	9.0	6.5	Quarterly	Grab	SU

a/ For intermittent discharges, the duration of the discharge shall be reported.

b/ Selenium will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.

c/ Oil and grease will be sampled when sheen is observed.

Leach System

The Ore Mining and Dressing Point Source Category, 40 CFR 440.103 (c), requires that there be no discharge of process wastewater to navigable waters from leach operations except under defined circumstances. The zero discharge provisions do not apply to drain down of water from the inactive waste rock leaching operations or other inactive facilities in the process of being closed. In that regard, Kennecott is treating drain down from inactive waste rock leaching operations with the neutralization capacity contained in copper tailings, and discharging the treated drain down to the tailings impoundment. In addition, drain down rinse water from Barneys Canyon historic heap leaching operation will be conveyed to the tailings impoundment.

Treatment of waste rock drain down is expected to continue during the term of this permit. Section 40 CFR 440.131(c) authorizes a discharge of process water if the facility is designed, constructed and maintained to contain the maximum volume from a 10-year 24-hour precipitation event. The capacity of the Small Bingham Reservoir is 79.3 acre-feet and the total combined capacity of the Zone 1 and 2 Large Bingham Reservoir is 1770 acre-feet.

SELF-MONITORING AND REPORTING REQUIREMENTS

The permit will require reports to be submitted monthly, quarterly and yearly as applicable, on the NetDMR system due 28 days after the end of the monitoring period. Lab sheets for biomonitoring must be attached to the biomonitoring NetDMR submittal.

STORMWATER

STORMWATER REQUIREMENTS

The discharge and management of all storm water throughout the Kennecott site shall be covered under this UPDES permit. The permit includes provisions relevant to the development of a Storm Water Pollution Prevention Plan (SWPPP). The Kennecott SWPPP includes different obligations depending on stormwater containment capacity (e.g., requirements relative to new facilities with containment of the 25-year, 24-hour storm runoff as compared with existing facilities with containment of the 10-year, 24-hour storm runoff).

Kennecott (or the activity contractor at the direction of Kennecott) shall complete site/project-specific SWPPPs for construction activities (all of which are associated with mining activities and covered by this permit). These site/project specific SWPPPs would then be integrated into the Kennecott UT0000051 SWPPP for operations when those construction activities are complete. Municipal Separate Storm Sewer Systems (MS4) requirements are applicable to Kennecott in isolated, unique cases relative to portions of Copperton and Magna where SL County has specific authority (including inspection obligations) over construction sites that actually or reasonably could be expected to discharge to a MS4 system. When construction activities have the potential to impact permitted MS4 communities, a separate, stand-alone Construction Storm water permit (NOI) shall be obtained and SWPPP developed as required.

Smelter Area Storm Water Runoff Management in Process Water System

Kennecott has developed a comprehensive storm water management system for the smelter, which includes containment of the 25-year 24-hour storm at the smelter. The following briefly describes the system.

Storm water discharges are collected and channeled through the smelter area utilizing a series of engineered channels and piping to convey storm water to a pair of storm water ponds not designed to discharge. Runoff from the operating facilities is routed to either the West Storm Water Pond, with a 3.5 million gallon storage capacity; or the East Storm Water Pond, with a 6.5 million-gallon storage capacity. A 40-acre area drains to the West Storm Water Pond. Of this, approximately 37 acres consists of impervious asphalt surfaces and building roofs. Facilities draining to this pond primarily consist of the west parking area, office areas and the asphalted area once occupied by the former Acid Plant 7 and 8. An area of 90 acres drains to the East Storm Water Pond. Of this, approximately 58 acres consists of impervious asphalt surfaces and building roofs. Primary facility areas draining to this pond include the repair and machine shop area, the smelter and reclaimed areas.

When storm water collects in the HDPE-lined West and East Storm Water Ponds, up to 350 gpm and 600 gpm respectively are pumped to the smelter West and East Process Water Ponds. In response to a significant storm event, any overflow from the West or East Storm Water Ponds will flow to the process water system through the Smelter Return Canal. The West and East Storm Water Ponds accept overflow from the West Process Water and East Process Water Ponds, respectively, during plant upset conditions such as power failures. When normal operations are restored, the water in the Storm Water Ponds is pumped back to the Process Water Ponds.

Non-operational areas will have storm water runoff routed to three different locations. Approximately 127 acres of native and reclaimed areas on the west side of the facility will drain to Japanese Springs via diversion channels reporting to the newly reconfigured Hazleton Fresh Water Pond or used for process makeup water with eventual discharge to the tailings impoundment or Great Salt Lake. Approximately 79 acres of east side native and reclaimed areas will drain to operational wetlands northeast of Praxair via diversion channels. An additional 3500 acres of land including both native and reclaimed areas, the smelter landfill, and Kessler Canyon will drain to the Kessler drainage channel which flows to the Smelter Return Canal for recycle back to the concentrator or to the Great Salt Lake via Outfall 008. The majority of this acreage is attributable to Kessler Canyon at 3450 acres.

Outfall SW3, Little Valley Storm Water

Storm water runoff from the area southeast of the historic North Concentrator complex may flow to the Little Valley Wash in the event of a significant storm. Outfall SW3 will be the monitoring point for this flow. Discharge from Outfall SW3 will only occur in response to a storm larger than a 10-year 24-hour event. Best Management Practices required for this discharge are that the discharge will occur only in response to a storm event and the discharge will be sampled as soon as practicable after flow is observed by personnel in the area. Test results will be reported for the same parameters as the tailings impoundment except for cyanide and biomonitoring.

Outfall SW4, Pine Canyon Storm Water

Outfall SW4 consists of storm water runoff from the Pine Canyon drainage area to Pine Canyon creek. The discharge will be monitored and sampled, if present, as soon as practicable after a major storm event. Monitoring and/or sampling (if discharge is present) shall occur at least twice per year. Test results will be reported for the same parameters as Outfall 009.

BIOSOLIDS

For clarification purposes, sewage sludge is considered solids, until treatment or testing shows that the solids are safe, and meet beneficial use standards. After the solids are tested or treated, the solids are then known as biosolids.

Class A biosolids, may be used for high public contact sites, such as home lawns and gardens, parks, or playing fields, etc. Class B biosolids may be used for low public contact sites, such as farms, rangeland, or reclamation sites, etc.

SUBSTANTIAL BIOSOLIDS TREATMENT CHANGES

This is the first time Biosolids requirements have been included in the Kennecott permit.

DESCRIPTION OF TREATMENT AND DISPOSAL

Biosolids produced at the Kennecott STP are separated from effluent via a screw press and are then transported to a bagging and drying facility on site. The solids are dried and analyzed for heavy metals, to be disposed of annually on site at the Kennecott permitted solid waste facility

SELF-MONITORING REQUIREMENTS

Under 40 CFR 503.16(a)(1), the self-monitoring requirements are based upon the amount of biosolids disposed per year and shall be monitored according to the chart below.

Minimum Frequency of Monitoring (40 CFR Part 503.16, 503.26. and 503.46)		
Amount of Biosolids Disposed Per Year		Monitoring Frequency
Dry US Tons	Dry Metric Tons	Per Year or Batch
> 0 to < 320	> 0 to < 290	Once Per Year or Batch
> 320 to < 1650	> 290 to < 1,500	Once a Quarter or Four Times
> 1,650 to < 16,500	> 1,500 to < 15,000	Bi-Monthly or Six Times
> 16,500	> 15,000	Monthly or Twelve Times

In 2015, Kennecott disposed of approximately 1200 pounds (< 1 DMT) of biosolids; therefore they need to sample at least once a year. However, Kennecott is not required to monitor for heavy metals or pathogens if the biosolids are disposed of in a landfill.

Landfill Monitoring

Under *40 CFR 258,* the landfill monitoring requirements include a paint filter test. If the biosolids do not pass a paint filter test, the biosolids cannot be disposed in the sanitary landfill *(40 CFR 258.28(c)(1).*

BIOSOLIDS LIMITATIONS

Heavy Metals

Class A Biosolids for Home Lawn and Garden Use

The intent of the heavy metals regulations of Table 3, *40 CFR 503.13* is to ensure the heavy metals do not build up in the soil in home lawn and gardens to the point where the heavy metals become phytotoxic to plants. The permittee will be required to produce an information sheet (see *Part III. C.* of the permit) to made available to all people who are receiving and land applying Class A biosolids to their lawns and gardens. If the instructions of the information sheet are followed to any reasonable degree, the Class A biosolids will be able to be land applied year after year, to the same lawns and garden plots without any deleterious effects to the environment. The information sheet must be provided to the public, because the permittee is not required, nor able to track the quantity of Class A biosolids that are land applied to home lawns and gardens.

Class A Requirements With Regards to Heavy Metals

If the biosolids are to be applied to a lawn or home garden, the biosolids shall not exceed the maximum heavy

metals in Table 1 and the monthly average pollutant concentrations in Table 3 (see Table 1 and Table 3 below). If the biosolids do not meet these requirements, the biosolids cannot be sold or given away for applications to home lawns and gardens.

Class B Requirements for Agriculture and Reclamation Sites

The intent of the heavy metals regulations of Tables 1, 2 and 3, of *40 CFR 503.13* is to ensure that heavy metals do not build up in the soil at farms, forest land, and land reclamation sites to the point where the heavy metals become phytotoxic to plants. The permittee will be required to produce an information sheet (see *Part III. C.* of the permit) to be handed out to all people who are receiving and land applying Class B biosolids to farms, ranches, and land reclamation sites (if biosolids are only applied to land owned by the permittee, the information sheet requirements are waived). If the biosolids are land applied according to the regulations of *40 CFR 503.13*, to any reasonable degree, the Class B biosolids will be able to be land applied year after year, to the same farms, ranches, and land reclamation sites without any deleterious effects to the environment.

Class B Requirements With Regards to Heavy Metals

If the biosolids are to be land applied to agricultural land, forest land, a public contact site or a reclamation site it must meet at all times:

> The maximum heavy metals listed in Table 1 and the heavy metals loading rates in Table 2; or
>
> The maximum heavy metals in Table 1 and the monthly heavy metals concentrations in Table 3.

Tables 1, 2, and 3 of Heavy Metal Limitations

Pollutant Limits, (40 CFR Part 503.13(b)) Dry Mass Basis				
Heavy Metals	Table 1	Table 2	Table 3	Table 4
	Ceiling Conc. Limits, (mg/kg)	CPLR1, (mg/ha)	Pollutant Conc. Limits, (mg/kg)	APLR2, (mg/ha-yr)
Total Arsenic	75	41	41	41
Total Cadmium	85	39	39	39
Total Copper	4300	1500	1500	1500
Total Lead	840	300	300	300
Total Mercury	57	17	17	17
Total Molybdenum	75	N/A	N/A	N/A
Total Nickel	420	420	420	420
Total Selenium	100	100	100	100
Total Zinc	7500	2800	2800	2800

Any violation of these limitations shall be reported in accordance with the requirements of *Part III.F.1.* of the permit .If the biosolids do not meet these requirements they cannot be land applied.

Pathogens

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1 CPLR -- Cumulative Pollutant Loading Rate

2 APLR – Annual Pollutant Loading Rate

The Pathogen Control class listed in the table below must be met;

Pathogen Control Class	
Class A	Class B
B Salmonella species –less than three (3) MPN3 per four (4) grams total solids (or less than 1,000 fecal coliforms per gram total solids)	Fecal Coliforms –less than 2,000,000 colony forming units (CFU) per gram total solids
Enteric viruses –less than one (1) MPN (or plaque forming unit) per four (4) grams total solids	
Viable helminth ova –less than one (1) MPN per four (4) grams total solids	

Class A Requirements for Home Lawn and Garden Use

If biosolids are land applied to home lawns and gardens, the biosolids need to be treated by a specific process to further reduce pathogens (PFRP), and meet a microbiological limit of less than less than 3 most probable number (MPN) of *Salmonella* per 4 grams of total solids (or less than 1,000 most probable number (MPN/g) of fecal coliform per gram of total solids) to be considered Class A biosolids.

Kennecott does not intend to give away biosolids for land application on home lawns or gardens, and will therefore not be required to meet PFRP. If the permittee changes their intentions in the future, they will need to meet a specific PFRP, the Director and the EPA must be informed at least thirty (30) days prior to its use. This change may be made without additional public notice

The practice of sale or giveaway to the public is an acceptable use of biosolids of this quality as long as the biosolids continue to meet Class A standards with respect to pathogens. If the biosolids do not meet Class A pathogen standards the biosolids cannot be sold or given away to the public, and the permittee will need find another method of beneficial use or disposal.

Pathogens Class B

If biosolids are to be land applied for agriculture or land reclamation the solids need to be treated by a specific process to significantly reduce pathogens (PSRP). Kennecott does not intend to land apply the biosolids and will therefore not be required to meet PSRP. If the permittee intends to land apply in the future, they will need to meet a specific PSRP, the Director and the EPA must be informed at least thirty (30) days prior to its use. This change may be made without additional public notice.

Vector Attraction Reduction (VAR)

If the biosolids are land applied Kennecott will be required to meet VAR through the use of a method of listed under *40 CFR 503.33.* Kennecott does not intend to land apply the biosolids and will therefore not be required to meet VAR. If the permittee intends to land apply in the future, they need to meet one of the listed alternatives in 40 CFR 503.33, the Director and the EPA must be informed at least thirty (30) days prior to its use. This change may be made without additional public notice.

Landfill Monitoring

Under *40 CFR 258,* the landfill monitoring requirements include a paint filter test to determine if the biosolids

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3 MPN –Most Probable Number

exhibit free liquid. If the biosolids do not pass a paint filter test, the biosolids cannot be disposed in the sanitary landfill *(40 CFR 258.28(c)(1).*

Record Keeping

The record keeping requirements from *40 CFR 503.17* are included under *Part III.G.* of the permit. The amount of time the records must be maintained are dependent on the quality of the biosolids in regards to the metals concentrations. If the biosolids continue to meet the metals limits of *Table 3* of *40 CFR 503.13*, and are sold or given away the records must be retained for a minimum of five years. If the biosolids are disposed in a landfill the records must retained for a minimum of five years.

Reporting

Kennecott must report annually as required in *40 CFR 503.18*. This report is to include the results of all monitoring performed in accordance with *Part III.B* of the permit, information on management practices, biosolids treatment, and certifications. This report is due no later than February 19 of each year. Each report is for the previous calendar year.

PRETREATMENT REQUIREMENTS

There is currently no discharge of process wastewater to the community of Magna sanitary sewer system. Any process wastewater that the facility may want to discharge to the public sanitary sewer in the future, either as direct discharge or as a hauled waste, would be subject to federal, state and local pretreatment regulations. Pursuant to section 307 of the Clean Water Act, the permittee shall comply with all applicable Federal General Pretreatment Regulations promulgated, found in 40 CFR section 403, the State Pretreatment Requirements found in UAC R317-8-8, and any specific local discharge limitations developed by the Publicly Owned Treatment Works (POTW) accepting the waste.

BIOMONITORING REQUIREMENTS

As part of a nationwide effort to control toxics, biomonitoring requirements are being included in all major permits and in minor permits for facilities where effluent toxicity is an existing or potential concern. Authorization for requiring effluent biomonitoring is provided for in *UAC R317-8-4.2* and *R317-8-5.3. The Whole Effluent Toxicity (WET) Control Guidance Document*, February 15, 1991, outlines guidance to be used by Utah Division of Water Quality staff and by permittees for implementation of WET control through the UPDES discharge permit program.

Outfall 012, which discharges to the Great Salt Lake, will conduct chronic and acute WET testing using the species *Cryprinodon variegatus* (sheepshead minnow) on a quarterly basis when the flow is greater than 1 MGD. Testing of *Mysidopsis bahia* (mysid shrimp) indicated that calcium concentrations above 350 mg/L affected *Mysidopsis bahia.* Monitoring of the calcium concentration will be performed and if the concentration drops below 350 mg/L, additional testing of the mysid shrimp is required to determine the appropriateness of this species.

WET is one of the tools used by the Division to evaluate compliance with the Narrative Standards. As in the previous permit, Kennecott is required to conduct acute WET monitoring. Chronic WET monitoring is required in this renewal permit because the dilution in the initial receiving water is less than 20:1. The results of the chronic testing will be used as an indicator of toxicity as recommended by the *Utah Division of Water Quality Interim Methods for Evaluating Use Support For Great Salt Lake, Utah Pollution Discharge Elimination System (UDPES) Permits, Review Draft Permitting Implementation Guidance for Great Salt Lake (January 4, 2016).*

If Kennecott discharges from Outfall 002, it must conduct WET tests using *Ceriodaphnia dubia*. Those tests should be performed monthly if the monthly average flow exceeds 10 MGD. Monitoring is only required quarterly when

the monthly average flow is less than 10 MGD. Because Outfall 002 discharges to a class 3E stream, only acute toxicity testing has been required.

If Kennecott discharges from Outfall 007, it must conduct WET tests quarterly using *Cyprinodon variegatus* if the quarterly average flow exceeds 1 MGD.

A limitation of no acute toxicity (LC 50) has been required to be effective since June 1, 1993 and will continue upon the re-issuance of the permit for Outfall 002. Provisions are in the permit for additional testing in the event 50 percent toxicity occurs and for conducting a toxicity reduction evaluation (TRE) in the event it becomes necessary at Outfall 002.

Only a yearly biomonitoring test using *Ceriodaphnia dubia* is required for Outfall 010 because it is not an active mine portal.

ANTIDEGRADATION

In accordance with UAC R317-2-3.5.b.1.(b), a Level II Antidegredation Review is not required during this permit renewal because there are no changes to effluent concentrations or loading from the previous permit.

PERMIT DURATION

It is recommended that this permit be effective for a duration of five (5) years.

DRAFTED BY

Kim Shelley and Nate Nichols, Discharge
Mike George and Harry Campbell, Storm Water
Dan Griffin, Biosolids
Chris Bittner and Mike Herkimer, Whole Effluent Toxicity
Nick von Stackelberg and Dave Wham, Wasteload Analysis
Chris Bittner, Use Supporting Evaluation for Outfall 012
Utah Division of Water Quality

PUBLIC NOTICE

Began: September 19, 2016
Ended: October 19, 2016
Public noticed in the Salt Lake Tribune and Deseret News.

Comments were received during the public comment period. A comment response summary was sent to all commenters on January 05, 2017. The final permit is not the same as the public noticed draft. It has been modified as per the comment response document. The modifications were determined to be minor in nature and as a result, the final permit was not re-public noticed.

Attachment 1

Wasteload Analysis and supporting documentation

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Alan Matheson
Executive Director

DIVISION OF WATER QUALITY
Walter L. Baker, P.E.
Director

Subject: Memorandum for Rio Tinto Kennecott Utah Copper 2016 Permit Renewal Fact Sheet Statement of Basis, Use support evaluation for Outfall 012 to Gilbert Bay, Great Salt Lake

Prepared By: Chris Bittner, Standards Coordinator

Summary: The purpose of this evaluation was to determine if the uses of the receiving water will be protected and if the permit must include water quality-based effluent limits. Based on the information provided by Rio Tinto Kennecott Copper (RTKC) regarding pollutant concentrations in the effluent for outfall 012-A, the uses designated in R317-2-12 and existing uses of the receiving waters (Class 5E Transitional Waters→Class 5A Gilbert Bay, Great Salt Lake) will be protected. To ensure that the uses remain protected, a new loading limit derived in accordance with UAC R317-8-4.2(4)a.2. for selenium is required. Additional requirements for monitoring the outfall delta and open waters, and a sufficiently sensitive analytical method for mercury monitoring were also added.

Receiving Waters and Designated Uses (UAC R317-2-6):

Transitional Waters

Class 5E protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain

Gilbert Bay, Great Salt Lake

Class 5A protected for frequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain

Introduction

At the current lake level, outfall 012-A discharges to Class 5E Transitional Waters along the Great Salt Lake (GSL or Lake) shoreline and then to Class 5A Gilbert Bay of GSL. The Transitional Waters are mudflats where the discharge creates a channel to Gilbert Bay. The channel appears to discharge some groundwater as well. The channel in the Transitional Waters currently exceeds one mile but these Transitional Waters only exist when GSL is below an elevation of 4208 feet. At a lake elevation of 4,208' the Transitional Waters do not exist as a separate use class because they are inundated by Gilbert Bay.

Outfall 001 from the Jordan Valley Water Conservancy District Southwest Groundwater Treatment Plant (SGTP) is also permitted to discharge next to RTKC outfall 012. The effluents from the two outfalls are expected to comingle in the Transitional Waters when construction of the SGTP pipeline is complete and both are discharging. When complete, the SGTP outfall is expected to continuously discharge whereas the RTKC discharge is intermittent.

Use Support Evaluation

At the Division of Water Quality's (Division's) request, KUC provided supplemental information in support of their permit renewal application (RTKC submittals dated April 29, 2014 [DWQ-2014-006141] and October 31, 2014 [DWQ-2014-014376]. The information was evaluated to: 1) document that the effluent will not violate water quality standards, and 2) determine if water quality-based effluents are required for the permit. Water quality-based effluent limits are required when the effluent has "reasonable potential" to cause or contribute to a violation of a water quality standard. The standard may be a numeric criterion or the Narrative Standards (UAC R317-2-7.2). Final permit limits are the lower of water quality-based effluent limits or technology-based effluent limits such as secondary treatment standards or categorical limits.

For Utah waters other than GSL, use support is determined by comparing the receiving water concentrations after mixing with the appropriate numeric criteria in UAC R317-2-14. This approach cannot be used for GSL because of the lack of numeric criteria. With the exception of a selenium standard for Gilbert Bay, the Transitional Waters and Gilbert Bay do not have numeric water quality criteria. However, the designated uses must still be protected and the requirements of the Narrative Standards met. In the absence of applicable numeric criteria to determine the need for effluent limits, the procedures described in UAC R317-8-4.2(4)(a)6 were applied to determine reasonable potential and if necessary, determine the water quality-based effluent limits to ensure protection of the uses.

Similar as was done for evaluating other permitted discharges to GSL, a screening approach was implemented to evaluate reasonable potential and use protection. The screening approach compared pollutant concentrations in the effluent to comparison values such as freshwater numeric criteria and ambient concentrations in the receiving waters (April 29, 2014 RTKC submittal). Absent evidence to the contrary, if the effluent pollutant concentrations are equal to or less than the comparison values, the conclusion is that the aquatic life uses of the receiving waters will remain supported with the addition of the pollutants in the effluent. Consistent with a screening process, failure to meet the comparison values is not an indication that the aquatic life uses would not be supported but does indicate that further analyses or data are needed to make a determination. If effluent concentrations potentially exceed the concentrations that would adversely affect the aquatic life uses for the Transitional Waters and Gilbert Bay, the pollutant has reasonable potential and water quality-based effluent limits are required. Reasonable potential determinations were based on best professional judgment after consideration of the magnitude between the effluent concentrations and the comparison values, the confidence in the applicability of the comparison values, the expected variability in effluent concentrations, and the representativeness of the effluent data.

Table 1 summarizes the outcome of the initial screening steps for each pollutant from the permit application and the RTKC supplemental data and analyses provided as April 29, 2014 and October 31, 2014 RTKC submittals. In the absence of contrary information, pollutants meeting the

comparison values do not require further evaluation. If a pollutant is potentially bioaccumulative and the comparison values did not consider bioaccumulation, additional evaluations may be necessary to determine if the bioaccumulative pollutant has reasonable potential. Bioaccumulative pollutants may accumulate in the aquatic food web of the transitional and open waters. The amount accumulated is dependent on both the concentration and length of time the aquatic organisms are exposed unless equilibrium is achieved within the organism's life span.

Selenium and mercury are potentially bioaccumulative pollutants in RTKC's effluent and are also expected to be in the effluent from the Jordan Valley Conservancy District (JVWCD) Southwest Groundwater Treatment Plant (UPDES # UT0025836). The two outfalls are expected to comingle in a common drainage in the Class 5E Transitional Waters when both are discharging. The potential impacts of the combined effluents were considered for these two potentially bioaccumulative pollutants.

Table 1
Summary of Initial Screening of Effluent Pollutants from April 29, 2014 RTKC Submittal

Pollutants with effluent concentrations less than the comparison values and concluded to not have reasonable potential (technology-based effluent limits may still apply)	Antimony Beryllium Chromium Lead Nickel Silver Thallium Zinc
Pollutants requiring additional evaluation to determine reasonable potential	Arsenic Cadmium Copper Mercury Selenium

Additional Evaluation of Pollutants Listed in Table 1

Arsenic concentrations in the effluent exceed the comparison values. However, arsenic concentrations are concluded to not have reasonable potential based on additional evaluation using the results of toxicity tests conducted using brine shrimp, an important ecosystem and commercial species in GSL, by Brix et al. (2003) as documented in the April 29, 2014 RTKC submittal. The no-effects concentration reported by Brix et al. (2003) for arsenic is substantially higher than the effluent concentrations and arsenic is concluded to not have reasonable potential.

Cadmium concentrations in the effluent exceed the comparison values. However, cadmium concentrations are concluded to not have reasonable potential based on the results of toxicity tests conducted using brine shrimp by Brix et al. (2006) as documented in the April 29, 2014 RTKC submittal. The no-effects concentration reported by Brix et al. (2006) for cadmium is substantially higher than the effluent concentrations.

Copper concentrations in the effluent exceed the comparison values. The potential for copper to impair the uses was further evaluated using the effluent concentrations reported by Brix et al. (2006) to adversely affect brine shrimp reproduction.

As documented in April 29, 2014 RTKC submittal (DWQ-2014-006141), Brix et al. (2006) reported that the median effective concentration[1] (EC_{50}) for effects on brine shrimp reproduction was 68 µg/l (dissolved)[2]. To protect against chronic effects on reproduction, an estimate of the no-observed-effects concentration or EC_{20} as opposed to an EC_{50} was derived by RTKC. RTKC obtained the raw data from Brix and calculated an EC_{20} of 59 µg/l.

Applying the default conversion factor from dissolved to total copper specified in UAC R317-2-14, the no-effects concentration for total recoverable copper concentration is 61 µg/l. This conversion factor appears to be conservative based on the data reported in Adams et al. (2015). Adams et al. (2015) reported geometric and arithmetic mean Cu translators of 0.67 and 0.77, respectively, based on dissolved and total recoverable Cu concentrations in Great Salt Lake water samples. RTKC has developed an extensive data set based on water samples collected from Outfall 012 which indicates the arithmetic and geometric mean translators are 0.75 and 0.73, respectively. The study design of Adams et al. (2015) wasn't specifically intended for developing translators and the RTKC effluent translators may not be representative of Gilbert Bay waters, but these translators would result in a total recoverable copper concentrations ranging from 79 to 91 µg/l before mixing.

Brine shrimp are not expected to inhabit the Class 5E Transitional Waters, so a dilution of 1.5 (May 5, 2015 Mixing Analysis Outfall Ditch to Great Salt Lake [DWQ-2015-016387) was calculated based on discharging to Class 5A Gilbert Bay in accordance with the mixing zone requirements of UAC R317-2-5. Applying the dilution to the 61 µg/l results in a maximum allowable average effluent concentration of 91 µg/l (total recoverable). RTKC reports in the April 29, 2014 RTKC Submittal that long-term average concentrations of copper in the effluent were 32 µg/l (total recoverable) and the maximum of the daily maximums was 55 µg/l (total recoverable). The maximum of the daily maximums (55 µg/l) is less than allowable average concentration of 91 µg/l indicating no reasonable potential.

Mercury concentrations in the effluent generally do not exceed the comparison values. Mercury was nondetect for the majority of the required effluent monitoring results using an analytical method sufficient to meet the technology-based limits. A different analytical method is needed to measure mercury concentrations at Utah's freshwater criterion of 12 ng/l (UAC R317-2-14). RTKC voluntarily analyzed additional samples collected from the tailings barge using a more sensitive mercury analytical method (no effluent was being discharged) Mercury concentrations in Great Salt Lake remain a focus of water quality investigations because of the concentrations measured in previous studies (see Great Salt Lake discussions in the DWQ 2008, 2010, and 2012/2014 Integrated Reports).

Methylmercury (MeHg), an organic form of mercury, is present in Gilbert Bay's water and biota at measurable concentrations (Appendix A, UDWQ, 2010). Because of the increased toxicity and

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[1] Concentration at which 50% of the test population was affected

[2] RTKC reports the copper EC_{50} as 69 µg/l in the April 29, 2014 RTKC Submittal but Brix et al. (2006) reports 68 µg/l.

biotransfer potential of MeHg compared to other forms of Hg found in the environment, MeHg has the greater potential for impairing the uses. The reader is cautioned to discern between MeHg and mercury in the following discussions.

Translators are necessary to determine reasonable potential for bioaccumulative compounds. Translators are simple mathematical models of complex processes. Translators are used to estimate the concentration of a pollutant in one media, for instance, brine shrimp, from the concentration in a different media, for instance, water. When mercury is released to the receiving waters, a portion of the mercury is expected to be methylated by indigenous bacteria (mercury to MeHg translator). A portion of this MeHg is taken up by the lower life forms such as invertebrates and a portion of this MeHg is transferred higher in the food web to other biota (MeHg in water to the lower and higher food web receptors). Currently these translators are unknown but ongoing studies may define the translators in the future.

Beginning in 2011, the SGTP and RTKC conducted monitoring of invertebrates, bird eggs, water and sediment in the transitional and open waters prior to any actual discharge from the SGTP (CH_2MHill, 2012; 2013; 2014; 2015; 2015a). RTKC outfall 012A has discharged during this time period but this area is also impacted by other potential sources of pollutants from the Lake.

The outfall delta is also being investigated as part of Tailing Causeway (GEI, 2015). Historically, mine tailings were used to construct a causeway at the south end of the Lake and to the east of the discharge delta. Some of these tailings have elevated metals concentrations relative to ambient concentrations and elevated metals concentrations were also measured in the outfall delta sediments. Metals concentrations were higher near the outfall and copper concentrations were higher in samples from the 6-12" interval than in the 0-6" interval (GEI, 2015). Evaluations of the significance of these elevated concentrations by the Utah Division of Environmental Response and Remediation are pending.

A less sensitive mercury analytical method was used for the GEI (2015) investigation compared to the CH2M Hill studies and when mercury was detected, the concentrations were generally higher than the concentrations measured in the CH2M Hill studies. GEI (2015) reports total mercury concentrations up to 200 µg/kg compared to a maximum of 25 µg/kg reported by CH2M Hill (2012; 2013; 2014; 2015; 2015a). Mercury concentrations measured in the invertebrate biota were variable ranging from 5 to 400 µg/kg DW (dry weight) (CH2M Hill, 2012; 2013; 2014; 2015; 2015a). The cause of the variability in mercury concentrations was not identified.

The available data is insufficient to determine if the mercury concentrations in GSL are supporting or impairing the uses (DWQ, 2014). However, the available studies on bird health suggest that birds are not being measurably adversely affected by mercury concentrations:

- Ackerman, J.T., Herzog, M.P., Hartman, C.A., Isanhart, J., Herring, G., Vaughn, S., Cavitt, J.F., Eagles-Smith, C.A., Browers, H., Cline, C., and Vest, J., 2015, Mercury and selenium contamination in waterbird eggs and risk to avian reproduction at Great Salt Lake, Utah: U.S. Geological Survey Open-File Report 2015-1020
- Cavitt, J. F. and N. Wilson, 2012. Concentrations of Selenium and Mercury in American Avocet Eggs at Great Salt Lake, Utah 2011 Report . Avian Ecology Laboratory, Weber State University

- Cavitt, J.F., M. Linford, and N. Wilson. Selenium Concentration in Shorebird Eggs at Great Salt Lake Utah 2010 Report, Avian Ecology Laboratory, Weber State University
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Mercury concentrations are concluded to have unknown reasonable potential (USEPA, 2009) because 1) mercury is potentially bioaccumulative and no translators from effluent mercury to methyl mercury and from water to tissue are available and 2) and 3) in 2005, mercury concentrations in the tissues of some waterfowl were determined to have accumulated to concentrations potentially unsafe for human consumption (see http://waterfowladvisories.utah.gov/), 4) the mercury results reported by CH2MHill (2012; 2013; 2014; 2015; 2015a) are highly variable and the current data is insufficient to characterize this variability or identify causes. No water quality-based effluent limits are required but the technology-based limit from the previous permit remains

To attempt to address the uncertainties regarding the lack of mercury translators, this permit includes monitoring requirements for the Joint Discharge Area Transitional Monitoring Program. The Joint Discharge Area Transitional Monitoring Program requires the monitoring of mercury in water, sediment, invertebrates, and bird eggs (if available) in the vicinity of the outfall delta and water and collocated brine shrimp (if available) in the open waters to address the data gaps regarding reasonable potential. The SGTP permit includes these same requirements. The Joint Discharge Area Transitional Monitoring Program may be conducted in cooperation with SGTP.

The limited sampling and analyses using analytical methods capable of measuring the 0.012 µg/l comparison value voluntarily conducted by KUC, mercury concentrations in the KUC's effluent alone should not adversely the uses. However, because the available data may not adequately characterize the effluent variability, additional effluent monitoring is also required. This permit requires that one effluent sample be analyzed for every 30 days of discharging.

Selenium concentrations in the effluent exceed the comparison values and selenium was concluded to have reasonable potential for the previous permit cycle. Utah does have a water quality standard for Gilbert Bay for selenium standard of 12.5 mg/kg DW in bird eggs. However, no translator is available to predict allowable water concentrations that correspond to a bird egg concentration of 12.5 mg/kg DW and hence the reliance on other comparison values for acceptable water concentrations. To date, hundreds of eggs have been sampled from Great Salt Lake and all of the egg selenium concentrations were below 12.5 mg/kg DW which supports that the current loadings of selenium to the Lake are not impairing the uses.

As presented in the Jordan Valley Conservancy District SGTP UPDES # UT0025836 Fact Sheet and Statement of Basis (DWQ, 2014) the SGTP will be a new source of selenium loading to the Lake. The SGTP outfall is permitted to discharge next to RTKC's outfall 012. The SGTP discharge, which also will contain selenium, was evaluated for reasonable potential along with

RTKC's discharge as part of the SGTP permit evaluation (DWQ, 2014). RTKC's selenium discharge was evaluated at the current effluent limit of 54 µg/l and a maximum annual loading of 900 kg. The 900 kg/yr selenium loading limit is a new limit for this permit.

Selenium loading from RTKC's discharge decreased markedly from 1999 to 2001 and then was relatively constant from 2003 through 2006 at about 900 kg/yr (Figure 1). Several studies investigating the potential impacts of selenium on birds were initiated when selenium loading was about 900 kg/yr from the RTKC discharge and these studies did not observe any adverse effects (e.g., DWQ, 2008). Lake concentrations of dissolved selenium did not increase or decrease predictably and remained less than 1 µg/l and appear uninfluenced by changes in selenium loading from RTKC (Figures 1 and 2). Total selenium loading for one year from 2006 to 2007 was estimated to be 1,500 kg and permanent losses were estimated to be 2,650 kg (Johnson and Naftz et al., in DWQ, 2008). RTKC's discharge was identified as the largest contributor to the 1,500 kg but the source of over 1,100 kg was not identified. In any case, dissolved selenium concentrations remain below 1 µg/l.

The data are inadequate to support modifications to the existing water quality-based effluent limits for both the Transitional Waters and Gilbert Bay. The data does support that RTKC's existing effluent limit of 54 µg/l is protective under existing conditions but additional data is needed to confirm that this limit remains protective if for instance, RTKC discharges more frequently than in the recent past. Therefore, the available data are insufficient to support changes to the existing selenium water quality-based effluent limit of 54 µg/l. The available data are also insufficient to determine reasonable potential when selenium loadings from both the SGTP and RTKC exceed 900 kg/year data. Therefore, a new interim annual loading limit of 900 kg is required by this permit.

In addition to conserving the previous use-based effluent limit, this permit includes new selenium monitoring requirement for water, sediment, invertebrates, and bird eggs (if available) in the vicinity of the outfall delta and collocated water and brine shrimp (if available) in the open waters to address the uncertainties regarding reasonable potential. As the data gaps and geographic locations are the same as identified for the SGTP, this permit includes the same Joint Discharge Area Transitional Monitoring Program requirements and implementation triggers for interpreting the egg data.

The permit also requires that RTKC submit a Sampling and Analysis Plan within 90-days of permit issuance. The Sampling and Analysis Plan will be implemented in 208 because with the 90-days and at least 30 additional days for public comment, this Sampling and Analysis Plan will not be approved in time for the 2017 nesting season. RTKC is still required to implement the Transitional Waters Monitoring Program consistent with this permit. The Sampling and Analysis Plan will also provide RTKC with an opportunity to address to recommend improvements to the existing approach to monitoring and interpretation of the results. The public and other interested parties will be provided an opportunity to comment on the proposed approaches.

Level II Antidegradation Review

In accordance with UAC R317-2-3.5.b.1.(b), a Level II antidegradation review is not required because there are no changes to effluent concentrations or loading compared to the previous permit.

WET (Whole Effluent Toxicity) Testing

WET is one of the tools used by the Division to evaluate compliance with the Narrative Standards. KUC is required to conduct acute WET monitoring under the requirements of the previous permit. For the upcoming permit cycle, chronic WET monitoring is required because the dilution in the initial receiving waters is zero (effluent dependent) resulting in dilution of less than 20:1. Both acute and chronic WET test results should be conducted and the results reported. The requirements and reporting of the acute WET testing should be conserved from the previous permit. The results of the new requirements for chronic testing will be used as an indicator of toxicity as recommended by the Utah Division of Water Quality *Interim Methods for Evaluating Use Support For Great Salt Lake, Utah Pollution Discharge Elimination System (UDPES) Permits, Review Draft Permitting Implementation Guidance for Great Salt Lake* (October 14, 2014).

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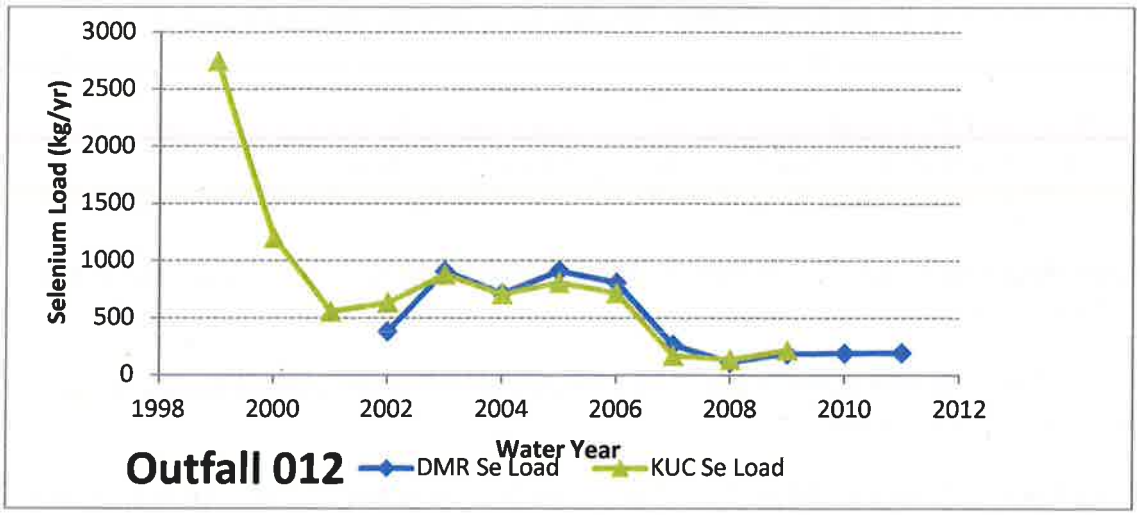

Figure 1. Selenium loads calculated from the DWQ Discharge Monitoring Reporting (DMR) Database and as estimated by Rio-Tinto Kennecott Copper

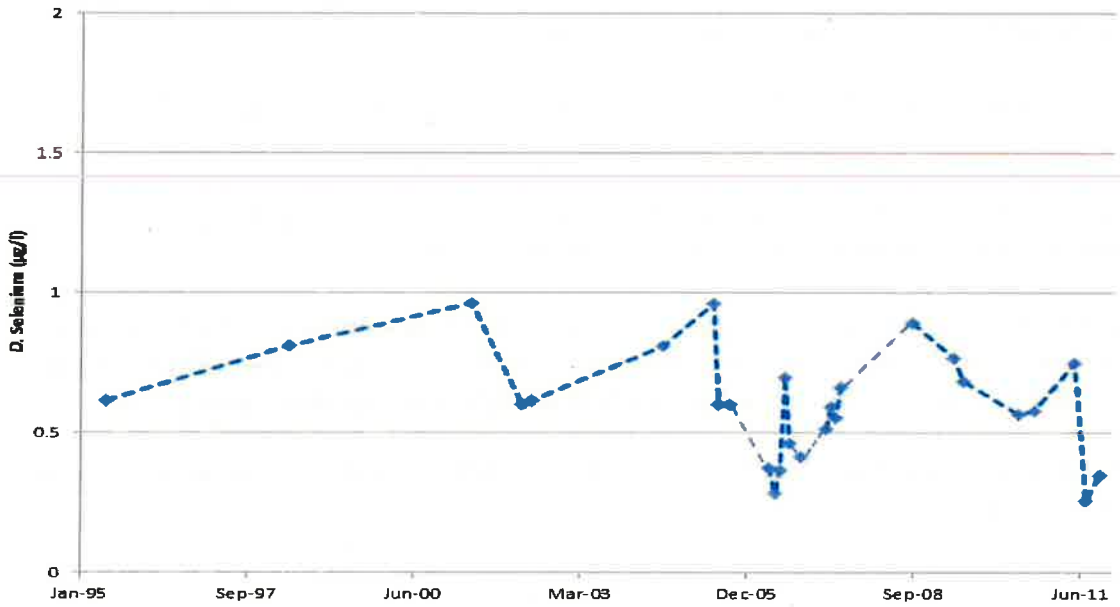

Figure 2. Selenium geometric mean concentrations for Gilbert Bay from USGS, Rio Tinto Kennecott Copper, and DWQ data

Utah Division of Water Quality
ADDENDUM
Statement of Basis
Wasteload Analysis

Date: **May 4, 2016**

Facility: **Rio Tinto Kennecott Copper**
UPDES No. UT-0000051

Outfall: **002, 007**

Receiving water: **C-7 Ditch, tributary to Lee Creek and Great Salt Lake**

This addendum summarizes the wasteload analysis that was performed to determine water quality based effluent limits (WQBEL) for this discharge. Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses (UAC R317-2-8). Projected concentrations are compared to numeric water quality standards to determine acceptability. The numeric criteria in this wasteload analysis may be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

Discharge

Outfall 002: C-7 Ditch → Lee Creek → Great Salt Lake
The maximum daily discharge for Outfall 002 is 50.0 MGD (77.4 cfs), as estimated by the permittee.

Outfall 007: C-7 Ditch → Lee Creek → Great Salt Lake
The maximum daily discharge for Outfall 007 is 15.0 MGD (23.2 cfs), as estimated by the permittee.

Receiving Water

The receiving water for Outfall 002 and 007 is the C-7 Ditch, which does not have designated beneficial uses. The C-7 Ditch was determined to be a drainage ditch that does not have downstream agricultural users of the water. Therefore, per UAC R317-2-13.10, the presumptive beneficial uses for all drainage canals and ditches statewide are 2B and 3E.

- *Class 2B: Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.*
- *Class 3E: Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.*

The C-7 Ditch is tributary to Lee Creek, which does not have designated beneficial uses. Therefore, per UAC R317-2-13.13, the presumptive beneficial uses for all waters not specifically classified are 2B and 3D.

- *Class 3D: Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.*

Protection of Downstream Uses

Per UAC R317-2-8, *all actions to control waste discharges under these rules shall be modified as necessary to protect downstream designated uses*. For this discharge, numeric aquatic life use criteria do not apply to the immediate receiving water (C-7 Ditch), but do apply to downstream receiving waters (Lee Creek). Therefore, Lee Creek is considered the limiting condition in this wasteload allocation to ensure protection of aquatic life uses.

Receiving Water Critical Flow

The critical flow for the wasteload analysis was considered the lowest stream flow for seven consecutive days with a ten year return frequency (7Q10). Flow records from USGS stream gage # 10172640 LEE CREEK NEAR MAGNA, UT, for the period 1971 – 1982 and 2006 – 2008 was obtained. The 7Q10 was estimated as the lowest seven day average from 5/24/2006 to 4/10/2008. This more recent period of record of the gage is more representative of the current higher flow regime in the creek; however, it is insufficient to statistically calculate the 7Q10 flow. Since no discharge occurred from Outfalls 002 and 007 during this period, the gage represents the flow available for dilution.

7Q10 Flow (Annual) = 17.9 cfs

Mixing Zone

The allowable mixing zone is 15 minutes of travel time for acute conditions, not to exceed 50% of stream width, and 2,500 feet for chronic conditions, per UAC R317-2-5. Water quality standards must be met at the end of the mixing zone.

The actual length of the mixing zone was not determined; however, it was presumed to remain within the maximum allowable mixing zone dimensions. Acute limits were calculated using 50% of the annual critical low flow.

Dilution Factor

The dilution factors were calculated assuming full mix with the receiving water at the end of the mixing zone (Table 1).

Table 1: Summary of dilution factor at end of mixing zone.

Outfall	Criteria	Flow (cfs)			Dilution Factor
		Lee Creek	Effluent	Mixed	
002	Chronic	17.9	77.4	95.3	0.81
	Acute	9.0	77.4	86.4	0.90
007	Chronic	17.9	23.2	41.1	0.56
	Acute	9.0	23.2	32.2	0.72

Parameters of Concern

The potential parameters of concern for the discharge/receiving water identified were dissolved metals, total suspended solids, and pH, as determined in consultation with the UPDES Permit Writer. WQBELs were determined for metals.

TMDL

Lee Creek is listed as impaired for total dissolved solids (TDS) according to the 2012/2014 303(d) list. However, this listing was based on an erroneous beneficial use Class 4 designation, and will be removed from the 2016 303(d) list.

WET Limits

The percent of effluent in the receiving water in a fully mixed condition, and acute and chronic dilution in a not fully mixed condition are calculated in the WLA in order to generate WET limits. The LC_{50} (lethal concentration, 50%) percent effluent for acute toxicity and the IC_{25} (inhibition concentration, 25%) percent effluent for chronic toxicity, as determined by the WET test, needs to be below the WET limits, as determined by the WLA. The WET limit for LC_{50} is typically 100% effluent and does not need to be determined by the WLA.

Table 2: WET Limits for IC_{25}

Outfall	Percent Effluent
002	81%
007	56%

Receiving Water Quality and Standards

The water quality standards for dissolved metals are dependent on hardness (total as $CaCO_3$). Based on DWQ monitoring data from C-7 Ditch and Lee Creek, the average hardness exceeds 400 mg/L. Per Utah R317-2-14, a maximum hardness of 400 mg/L was used for determining the dissolved metals criteria. Ambient conditions were estimated using monitoring data from 1999-2009 from DWQ #4991430 LEE CREEK AT I80 CROSSING. The 80th percentile of observed data was calculated, with one-half the reporting limit assumed for non-detects.

Table 3: Water quality standards for dissolved metals for a hardness of 400 mg/L and ambient conditions for #4991430 LEE CREEK AT I80 CROSSING (1999-2009).

Dissolved Metal	Ambient 80th Percentile (µg/L)	Acute Standard (µg/L)	Chronic Standard (µg/L)
Aluminum	58[a]	750	N/A[b]
Arsenic	15.8	340	150
Cadmium	0.50	7.7	0.64
Chromium VI	7.3[a]	16.0	11.0
Chromium III	154[a]	1,773	231
Copper	6.0	49.6	29.3
Cyanide	3.5[a]	22.0	5.2
Iron	667[a]	1,000	NONE
Lead	1.5	281	10.9
Mercury	0.008[a]	2.4	0.012
Nickel	112[a]	1,513	168
Selenium	4.2	18.4	4.6
Silver	23.3[a]	34.9	NONE
Zinc	15.0	379	382

a Ambient concentration assumed 2/3 of water quality criteria.
b The criterion for aluminum is implemented as follows:
Where the pH is equal to or greater than 7.0 and the hardness is equal to or greater than 50 ppm as CaC03 in the receiving water after mixing, the 87 µg/L chronic criterion (expressed as total recoverable) will not apply, and aluminum will be regulated based on compliance with the 750 µg/L acute aluminum criterion (expressed as total recoverable).

Effluent Limits

Effluent limits for conservative pollutants were determined using a mass balance mixing analysis (UDWQ 2012). The hardness dependent conversion factors (CF) per UAC R317-2-14 Table 2.14.3a and Table 2.14.3b were used to translate the dissolved metals effluent limits to total recoverable metals effluent limits, assuming a hardness of 400 mg/L. Effluent limits for total recoverable metals are presented in Table 4.

Table 4: WQBELs for Total Recoverable Metals (µg/L)

Metal	Outfall 002		Outfall 007	
	Acute 1-hr Ave	Chronic 4-day Ave	Acute 1-hr Ave	Chronic 4-day Ave
Aluminum	830	N/A	1,017	N/A
Arsenic	378	181	465	254
Cadmium	9.7	0.79	11.9	0.89
Chromium VI	17.0	11.8	19.3	13.8
Chromium III	6,205	289	7,588	337
Copper	56.9	36.1	69.2	49.2
Cyanide	24.1	5.6	29.1	6.5
Iron	1,039	NONE	1,129	NONE
Lead	532	22.3	660	30.9
Mercury	2.7	0.013	3.3	0.015
Nickel	1,678	182	2,057	212
Selenium	20.0	4.7	23.9	4.9
Silver	42.7	NONE	46.4	NONE
Zinc	431	474	531	675

Model and supporting documentation are available for review upon request.

Antidegradation Level I Review

The objective of the Level I ADR is to ensure the protection of existing uses, defined as the beneficial uses attained in the receiving water on or after November 28, 1975. No evidence is known that the existing uses deviate from the designated beneficial uses for the receiving water. Therefore, the beneficial uses will be protected if the discharge remains below the WQBELs` presented in this wasteload. A Level II Antidegradation Review (ADR) is not required for this discharge since the pollutant concentration and load is not increasing under this permit renewal.

Prepared by:
Nicholas von Stackelberg, P.E.
Standards and Technical Services Section

Documents:

WLA Document: *kennecott_002&007_wla_2016-05-04.doc*
Analysis: *kennecott_wla_2016.xls*

References:

Utah Division of Water Quality. 2012. *Utah Wasteload Analysis Procedures Version 1.0.*

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Alan Matheson
Executive Director

DIVISION OF WATER QUALITY
Walter L. Baker, P.E.
Director

MEMORANDUM

TO: Kennecott Copper File UPDES UT00000051

THROUGH Kim Shelley

FROM: Dave Wham

DATE: 6-25-2012

SUBJECT: Kennecott Copper Outfall #009 WLA

I am writing in response to your request for a wasteload allocation for the permit renewal for the Kennecott Copper UPDES UT0000051. It is my understanding that this discharge emanates from the Pine Canyon Tunnel into a drainage ditch, which than flows for approximately a quarter mile before going dry. The drainage ditch is not connected to any live waters and is presumptively designated with 2B (secondary contact recreation) and 3E (Severely habitat-limited waters) classifications. The Permitee has indicated that the maximum expected flow from the tunnel is 0.086 mgd. The discharge makes up the receiving water, so the 2B end-of- pipe numeric standards for E. Coli, turbidity and pH apply. No numeric standards apply to 3E waters.

Let me know if you need any further info or clarification.

cc: John Kennington
Carl Adams

195 North 1950 West • Salt Lake City, UT
Mailing Address: P.O. Box 144870 • Salt Lake City, UT 84114-4870
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Utah Division of Water Quality
Statement of Basis
ADDENDUM
Wasteload Analysis and Antidegradation Level I Review - PRELIMINARY

Date:	**March 7, 2016**
Prepared by:	**Dave Wham** **Standards and Technical Services**
Facility:	**Rio Tinto Kennecott Copper** **UPDES No. UT-0000051** **Outfall 011**
Receiving water:	**Utah Salt Lake Canal => Ritter Canal => C7 Ditch => Lee Creek River (2B, 3D, 4)**

This addendum summarizes the wasteload analysis that was performed to determine water quality based effluent limits (WQBEL) for this discharge. Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses (UAC R317-2-8). Projected concentrations are compared to numeric water quality standards to determine acceptability. The numeric criteria in this wasteload analysis may be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

Discharge

Outfall 011: Adamson Spring

The maximum daily discharge for the facility is 3.9 MGD (6.0 cfs) as estimated by the permittee.

Receiving Water

The receiving water for Outfall 011 is the Utah-Salt Lake Canal, thence to the Ritter Canal, thence the C7 ditch, which discharges to Lee Creek.

Lee Creek does not have specific designated beneficial uses; therefore per UAC R317-2-13.13, the presumptive beneficial uses are 2B and 3D.

- *Class 2B - Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.*

- *Class 3D - Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.*

Typically, the critical flow for the wasteload analysis is considered the lowest stream flow for seven consecutive days with a ten year return frequency (7Q10). Flow records from USGS stream gage # 10172640 LEE CREEK NEAR MAGNA, UT, for the period 1971 – 1982 and 2006–2008 was obtained. The 7Q10 was estimated as the lowest seven day average from 5/24/2006 to 4/10/2008. This more recent period of record of the gage is more representative of the current higher flow regime in the creek; however, it is insufficient to statistically calculate the 7Q10 flow. Since no discharge occurred from Outfalls 002 and 007 during this period, the gage represents the flow available for dilution.

7Q10 Flow (Annual) = 17.9 cfs

TMDL

Lee Creek is listed as impaired for total dissolved solids (TDS) according to Utah's 2014 303(d) Water Quality Assessment. However, this listing was based on an erroneous Class 4 beneficial use designation, and will be removed from the 2016 3030(d) list.

Mixing Zone

The maximum allowable mixing zone is 15 minutes of travel time for acute conditions, not to exceed 50% of stream width, and 2,500 feet for chronic conditions, per UAC R317-2-5. Water quality standards must be met at the end of the mixing zone.

The actual length of the mixing zone was not determined; however, it was presumed to remain within the maximum allowable mixing zone dimensions. Acute limits were calculated using 50% of the annual critical low flow.

Parameters of Concern

The parameters of concern identified for the discharge/receiving water were dissolved metals, total suspended solids, and pH as determined in consultation with the UPDES Permit Writer.

WET Limits

The percent of effluent in the receiving water in a fully mixed condition, and acute and chronic dilution in a not fully mixed condition are calculated in the WLA in order to generate WET limits. The LC_{50} (lethal concentration, 50%) percent effluent for acute toxicity and the IC_{25} (inhibition concentration, 25%) percent effluent for chronic toxicity, as determined by the WET test, needs to be below the WET limits, as determined by the WLA. The WET limit for LC_{50} is typically 100% effluent and does not need to be determined by the WLA.

IC25 WET limits for Outfall 011 should be based on 25% effluent.

Receiving Water Quality and Standards

The water quality standards for dissolved metals are dependent on hardness (total as CaCO3). Based on DWQ monitoring data from C-7 Ditch and Lee Creek, the average hardness exceeds 400 mg/L. Per Utah R317-2-14, a maximum hardness of 400 mg/L was used for determining the dissolved metals criteria. Ambient conditions were estimated using monitoring data from 1999-2009 from DWQ #4991430 LEE CREEK AT I80 CROSSING. The 80th percentile of observed data was calculated, with one-half the reporting limit assumed for non-detects.

Table 1: Water quality standards for dissolved metals for a hardness of 400 mg/L and ambient conditions for #4991430 LEE CREEK AT I80 CROSSING (1999-2009).

Dissolved Metal	Ambient 80th Percentile (µg/L)	Acute Standard (µg/L)	Chronic Standard (µg/L)
Aluminum	58[a]	750	NA[b]
Arsenic	15.8	340	150
Cadmium	0.50	7.7	0.64
Chromium VI	7.3[a]	16.0	11.0
Chromium III	154[a]	1773	231
Copper	6.0	49.6	29.3
Cyanide	3.5[a]	22.0	05.2
Iron	667[a]	1000	None
Lead	1.5	281	10.9
Mercury	.008[a]	2.4	.012
Nickle	112[a]	1513	168
Selenium	4.2	18.4	4.6
Silver	23.3[a]	34.9	None
Zinc	15.0	379	382

[a] Ambient concentration assumed 2/3 of water quality criteria.

[b] The criterion for aluminum is implemented as follows:
Where the pH is equal to or greater than 7.0 and the hardness is equal to or greater than 50 ppm as CaC03 in the receiving water after mixing, the 87 µg/L chronic criterion (expressed as total recoverable) will not apply, and aluminum will be regulated based on compliance with the 750 µg/L acute aluminum criterion (expressed as total recoverable).

Effluent Limits

Effluent limits for conservative pollutants were determined using a mass balance mixing analysis (UDWQ 2012). The hardness dependent conversion factors (CF) per UAC R317-2-14 Table 2.14.3a and Table 2.14.3b were used to translate the dissolved metals effluent limits to total recoverable metals effluent limits, assuming a hardness of 400 mg/L. Effluent limits for total recoverable metals are presented in Table 2

Table 2: WQBELs for Total Recoverable Metals (ug/l), Outfall 011

Metal	Acute 1-hr Average	Chronic 4-day Average
Aluminum	1776	NA
Arsenic	821	548
Cadmium	21	1.3
Chromium VI	28	21.9
Chromium III	13214	534
Copper	119	102
Cyanide	50	10.3
Iron	1495	None
Lead	1180	66.2
Mercury	6	0.024
Nickle	3598	335
Selenium	40	5.8
Silver	61	None
Zinc	940	1493

Antidegradation Level I Review

The objective of the Level I ADR is to ensure the protection of existing uses, defined as the beneficial uses attained in the receiving water on or after November 28, 1975. No evidence is known that the existing uses deviate from the designated beneficial uses for the receiving water. Therefore, the beneficial uses will be protected if the discharge remains below the WQBELs presented in this wasteload. A Level II Antidegradation Review (ADR) is not required for this discharge since the pollutant concentration and load is not increasing under this permit renewal.

Documents:

WLA Document: *Kennecott_WLA011Doc_3-7-16.docx*
Wasteload Analysis and Addendum: *Kennecott_WLA011_2016.xlsm*

References:

Utah Division of Water Quality. 2012. *Utah Wasteload Analysis Procedures Version 1.0.*

Utah Division of Water Quality
Statement of Basis
ADDENDUM
Wasteload Analysis and Antidegradation Level I Review - PRELIMINARY

Date: **March 8, 2016**

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Standards and Technical Services

Facility: **Rio Tinto Kennecott Copper**
UPDES No. UT-0000051
Outfall 010; Butterfield Tunnel

Receiving water: **Butterfield Creek (2B, 3D, 4)**

This addendum summarizes the wasteload analysis that was performed to determine water quality based effluent limits (WQBEL) for this discharge. Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses (UAC R317-2-8). Projected concentrations are compared to numeric water quality standards to determine acceptability. The numeric criteria in this wasteload analysis may be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

Discharge

Outfall 010: Butterfield Tunnel

The maximum daily discharge for the facility is .65 MGD (1.0 cfs) as estimated by the permittee.

Receiving Water

The receiving water for Outfall 010 is Butterfield Creek which is tributary to the Jordan River.

Butterfield Creek's designated beneficial uses, as per UAC R317-2-13.5, uses are 2B, 3D, 4.

- *Class 2B - Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.*

- *Class 3D - Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.*

- *Class 4 -- Protected for agricultural uses including irrigation of crops and stock watering.*

Typically, the critical flow for the wasteload analysis is considered the lowest stream flow for seven consecutive days with a ten year return frequency (7Q10). Due to a lack of flow records for Butterfield Creek, the 20th percentile of available flow measurements was calculated for the period of record to approximate the 7Q10 low flow condition. The source of flow data was DWQ sampling station #4994450; BUTTERFIELD CANYON CK AB KCC 010 (1996-2006).

The critical low flow condition for Butterfield Creek is 0.55 cfs.

Ambient Butterfield Creek water quality was characterized based on samples collected from DWQ sampling station #4994450; BUTTERFIELD CANYON CK AB KCC 010 (1996-2006).

TMDL

Butterfield Creek is listed as impaired for total dissolved solids (TDS), Selenium, and *E. coli* according to Utah's 2014 303(d) Water Quality Assessment. A TMDL has not been completed for these constituents and this time. Water quality based effluent limits (WQBELs) for these constituents will be set at the applicable water quality standards with no allowance for mixing.

Mixing Zone

The maximum allowable mixing zone is 15 minutes of travel time for acute conditions, not to exceed 50% of stream width, and 2,500 feet for chronic conditions, per UAC R317-2-5. Water quality standards must be met at the end of the mixing zone.

The actual length of the mixing zone was not determined; however, it was presumed to remain within the maximum allowable mixing zone dimensions. Acute limits were calculated using 50% of the annual critical low flow.

Parameters of Concern

The parameters of concern identified for the discharge/receiving water were dissolved metals, TDS, *E. coli*, and pH as determined in consultation with the UPDES Permit Writer.

WET Limits

The percent of effluent in the receiving water in a fully mixed condition, and acute and chronic dilution in a not fully mixed condition are calculated in the WLA in order to generate WET limits. The LC_{50} (lethal concentration, 50%) percent effluent for acute toxicity and the IC_{25} (inhibition concentration, 25%) percent effluent for chronic toxicity, as determined by the WET test, needs to be below the WET limits, as determined by the WLA. The WET limit for LC_{50} is typically 100% effluent and does not need to be determined by the WLA.

IC25 WET limits for Outfall 010 should be based on 65% effluent.

Receiving Water Quality and Standards

The water quality standards for dissolved metals are dependent on hardness (total as CaCO3). Based on DWQ monitoring data from Butterfield Creek an average hardness of 246 mg/L was used for determining the dissolved metals criteria. Ambient conditions were estimated using monitoring data from 4994450; BUTTERFIELD CANYON CK AB KCC 010 (1996-2006). The 80th percentile of observed data was calculated, with one-half the reporting limit assumed for non-detects.

Table 1: Water quality standards for dissolved metals for a hardness of 400 mg/L and ambient conditions for #4994450; BUTTERFIELD CANYON CK AB KCC 010 (1996-2006).

Dissolved Metal	Ambient 80th Percentile (µg/L)	Acute Standard (µg/L)	Chronic Standard (µg/L)
Aluminum	15.0	750	NA[b]
Arsenic	2.5	340	150
Cadmium	0.50	4.8	0.46
Boron	50.3	750	None
Chromium VI	2.5	16.0	11.0
Chromium III	2.5	1189	155
Copper	12.9[a]	31.3	19.3
Cyanide	3.5[a]	22.0	5.2
Iron	667[a]	1000	None
Lead	4.4[a]	169	6.6
Mercury	0.008[a]	2.4	0.012
Nickle	5	1002	111
Selenium	1.2	18.4	4.6
Silver	10.1[a]	15.1	None
Zinc	15.0	251	253

[a] Ambient concentration assumed 2/3 of water quality criteria.
[b] The criterion for aluminum is implemented as follows:
Where the pH is equal to or greater than 7.0 and the hardness is equal to or greater than 50 ppm as CaC03 in the receiving water after mixing, the 87 µg/L chronic criterion (expressed as total recoverable) will not apply, and aluminum will be regulated based on compliance with the 750 µg/L acute aluminum criterion (expressed as total recoverable).

Effluent Limits

Effluent limits for conservative pollutants were determined using a mass balance mixing analysis (UDWQ 2012). The hardness dependent conversion factors (CF) per UAC R317-2-14 Table 2.14.3a and Table 2.14.3b were used to translate the dissolved metals effluent limits to total recoverable metals effluent limits, assuming a hardness of 246 mg/L. Effluent limits for total recoverable metals are presented in Table 2

Table 2: WQBELs for Total Recoverable Metals (ug/l), Outfall 010

Metal	Acute 1-hr Average	Chronic 4-day Average
Aluminum	951	NA
Arsenic	432	548
Cadmium	6.62	1.3
Boron	941	None
Chromium VI	19.7	21.9
Chromium III	4791	534
Copper	38	102
Cyanide	27	10.3
Iron	1091	None
Lead	325	66.2
Mercury	3.05	0.024
Nickle	1277	335
Selenium	18.4[a]	4.6[a]
Silver	19.4	None
Zinc	323	1493

[a] Receiving water is 303(d) listed for constituent. WQBELs equal the standard.

The receiving water is 303(d) listed for TDS, therefore, an acute limit of 1200 mg/l applies. The receiving water is 303(d) listed for *E. coli*, therefore, a 30-day geometric mean of 206 (No.#/100 ML) and a maximum of 668 (No.#/100 ML) apply.

Antidegradation Level I Review

The objective of the Level I ADR is to ensure the protection of existing uses, defined as the beneficial uses attained in the receiving water on or after November 28, 1975. No evidence is known that the existing uses deviate from the designated beneficial uses for the receiving water. Therefore, the beneficial uses will be protected if the discharge remains below the WQBELs presented in this wasteload. A Level II Antidegradation Review (ADR) is not required for this discharge since the pollutant concentration and load is not increasing under this permit renewal.

Documents:

WLA Document: *Kennecott_WLA010Doc_3-7-16.docx*
Wasteload Analysis and Addendum: *Kennecott_WLA010_2016.xlsm*

References:

Utah Division of Water Quality. 2012. *Utah Wasteload Analysis Procedures Version 1.0.*

Utah Division of Water Quality
Mixing Analysis

Date: **May 5, 2015**

Facility: **Kennecott Utah Copper**
UPDES No. UT-0000051

Outfall: **012**

Receiving water: **Outfall 012 Ditch to Great Salt Lake**

The purpose of this document is to present the methods and results of the mixing analysis for Kennecott Utah Copper's (KUC) Outfall 012 discharge to the open water of Gilbert Bay of the Great Salt Lake.

Site Reconnaissance

An inspection of Outfall 012 was conducted on December 23, 2014. The outfall originates at the KUC tailings pond and discharges to a drainage ditch within the transitional waters of the Great Salt Lake, which has designated use 5E (Figure 1). The drainage ditch was followed out to the confluence with the open waters of Gilbert Bay. Due to the low lake elevation, the ditch becomes less well-defined and forms smaller and smaller braided channels and sheet flows as it drains to the open water (Figure 2).

Parameters of Concern

The parameter of concern identified for the discharge and receiving water was copper. The mixing analysis was conducted for copper, but could apply to other conservative parameters.

The average concentration of copper in Gilbert Bay was 0.011 mg/L and the concentration of the effluent was 0.036 mg/L, for an effluent concentration excess of 0.025 mg/L.

Mixing Zone

The allowable mixing zone for discharges to lakes shall not exceed 35 feet for acute conditions and 200 feet for chronic conditions, per UAC R317-2-5.

Mixing Analysis

The dilution factor for copper at 200 feet into Gilbert Bay, which is the boundary of the mixing zone for chronic conditions, was determined for this analysis.

The CORMIX model (Doneker and Jirka, 2007), Version 9.0, was utilized for the analysis. CORMIX is a USEPA-supported mixing zone model and decision support system for environmental impact assessment of regulatory mixing zones resulting from point source discharges. CORMIX has the ability to simulate buoyant surface discharges, which occurs during low lake levels when the less dense effluent flows into the more dense hypersaline waters of Gilbert Bay.

CORMIX divides the mixing analysis into a near-field and a far-field, with different hydrodynamic equations applicable to each zone. The 200-foot boundary of the allowable chronic mixing zone typically falls within the near-field.

A sensitivity analysis was performed to evaluate the effect of key model inputs, including: effluent velocity, density, and excess copper concentration; Gilbert Bay current velocity, roughness, and ambient wind speed; and effluent channel width. The model inputs were varied over reasonably expected ranges. Gilbert Bay depth and density, and effluent channel depth were not varied.

Table 1 summarizes the model inputs and outputs for the mixing analysis simulations. The model was relatively insensitive to effluent concentration excess, effluent density, ambient wind speed, and effluent channel width. The highest dilution factor occurred under the scenario with the lowest effluent velocity and highest current velocity.

A reasonable set of parameters that represent critical conditions is highlighted in green in Table 1. With the selected model inputs, the dilution factor for copper was 1.5.

All model input and output files are available for review.

References

Doneker, R.L. and G.H. Jirka. 2007. CORMIX User Manual, A Hydrodynamic Mixing Zone Model and Decision Support System for Pollutant Discharges into Surface Waters. United States Environmental Protection Agency. EPA-823-K-07-001

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Table 1: CORMIX model inputs and dilution results at 200 foot mixing zone boundary for chronic criteria

Effluent			Gilbert Bay					Discharge Geometry		Output		Inputs
Velocity (ft/s)	Concentration Excess (mg/L)	Density (kg/m^3)	Depth (ft)	Velocity (ft/s)	Wind (mph)	Mannings n	Density (kg/m^3)	Channel Width (ft)	Channel Depth (ft)	Concentration Excess (mg/L)	Dilution	
0.5	0.025	1005.71	0.5	0.1	6.8	0.04	1100	10	0.5	0.016513	1.5	Baseline Scenario; Min. monthly wind
0.1	0.025	1005.71	0.5	0.1	6.8	0.04	1100	10	0.5	0.002238	11.2	Low effluent velocity
1.0	0.025	1005.71	0.5	0.1	6.8	0.04	1100	10	0.5	0.018075	1.4	High effluent velocity
0.5	0.025	1005.71	0.5	0.01	6.8	0.04	1100	10	0.5	0.025	1.0	Stagnant water
0.5	0.025	1005.71	0.5	0.1	0	0.04	1100	10	0.5	0.016997	1.5	No wind
0.5	0.025	1005.71	0.5	0.1	8.3	0.04	1100	10	0.5	0.016199	1.5	Ave annual wind speed
0.5	0.043	1005.71	0.5	0.1	6.8	0.04	1100	10	0.5	0.028402	1.5	Max monthly conc. exceedance
0.5	0.025	1007.27	0.5	0.1	6.8	0.04	1100	10	0.5	0.016659	1.5	High effluent density
0.5	0.025	1005.71	0.5	0.1	6.8	0.04	1100	5	0.5	0.015473	1.6	Low channel width
0.5	0.025	1005.71	0.5	0.1	6.8	0.02	1100	10	0.5	0.025	1.0	Low Mannings n
0.5	0.025	1005.71	0.5	0.5	0	0.04	1100	10	0.5	0.00321	7.8	High current velocity; No wind
1.0	0.025	1005.71	0.5	0.1	0	0.04	1100	10	0.5	0.025	1.0	High effluent velocity; No wind
1.0	0.025	1005.71	0.5	0.1	8.3	0.04	1100	10	0.5	0.017684	1.4	High effluent velocity; Ave annual wind speed
0.5	0.025	1005.71	0.5	0.5	0	0.04	1100	5	0.5	0.001484	16.8	High current velocity; No wind; Low channel width
1.0	0.025	1005.71	0.5	0.5	0	0.04	1100	10	0.5	0.0061	4.1	High effluent velocity; High current velocity; No wind
0.1	0.025	1005.71	0.5	0.5	0	0.04	1100	10	0.5	0.000507	49.4	Low effluent velocity; High current velocity; No wind

Figure 1: Drainage ditch at KUC Outfall 012

Figure 2: Drainage ditch forming smaller braided channels and sheet flow.