STATE OF UTAH
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY
UTAH WATER QUALITY BOARD
P.O. BOX 144870
SALT LAKE CITY, UTAH 84114-4870

Ground Water Discharge Permit
Permit No. UGW350011

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

Kennecott Utah Copper LLC
4700 Daybreak Parkway
South Jordan, Utah 84095

hereafter referred to as the "Permittee" is granted a Ground Water Discharge Permit for the operation of the **Tailings Impoundment** in Salt Lake County, Utah.

The Tailings Impoundment is located on the following tract of land (Salt Lake Base and Meridian):
Township 1 South, Range 2 West - Portions of Sections 5, 6, 7, 8, 9, 17, 18, 19, and 20
Township 1 South, Range 3 West - Portions of Sections 1, 2, 3, 10, 11, 12, 13, 14, 15, 23, and 24
Township 1 North, Range 2 West - Portions of Section 31
Township 1 North, Range 3 West - Portions of Section 35 and 36

The permit is based on representations made by the Permittee and other information contained in the administrative record. It is the responsibility of the Permittee to read and understand all provisions of this permit.

The facility shall be constructed and operated in accordance with conditions set forth in the permit and the Utah Administrative Rules for Ground Water Quality Protection (UAC R317-6).

This **renewed** Ground Water Quality Discharge Permit for the Tailings Impoundment amends and supersedes all other Ground Water Discharge Permits previously issued for these facilities.

This permit shall become effective on January 12, 2011.

This permit and the authorization to operate shall expire at midnight, January 12, 2016.

Signed this 12th day of January, 2011.

_____

Leah Ann Lamb
Acting Executive Secretary
Utah Water Quality Board

TABLE OF CONTENTS

I. SPECIFIC PERMIT CONDITIONS 3
- A. Ground Water Classification and Protection Levels 3
- B. Best Available Technology Performance Standard 3
- C. Permitted Facilities 4
- D. Permitted Inflow Waste Streams 4
- E. Monitoring 5
- F. Demonstration of Compliance 7
- G. Non- Compliance for Best Available Technology 8
- H. Reporting Requirements 9
- I. Compliance Schedule 9

II. MONITORING, RECORDING AND REPORTING REQUIREMENTS 11
- A. Representative Sampling 11
- B. Analytical Procedures 11
- C. Penalties for Tampering 11
- D. Reporting of Monitoring Results 11
- E. Compliance Schedules 11
- F. Additional Monitoring by the Permittee 11
- G. Records Contents 11
- H. Retention of Records 12
- I. Twenty-four Hour Notice of Noncompliance and Spill Reporting 12
- J. Other Noncompliance Reporting 12
- K. Inspection and Entry 13

III. COMPLIANCE RESPONSIBILITIES 14
- A. Duty to Comply 14
- B. Penalties for Violations of Permit Conditions 14
- C. Need to Halt or Reduce Activity not a Defense 14
- D. Duty to Mitigate 14
- E. Proper Operation and Maintenance 14

IV. GENERAL REQUIREMENTS 15
- A. Planned Changes 15
- B. Anticipated Noncompliance 15
- C. Permit Actions 15
- D. Duty to Reapply 15
- E. Duty to Provide Information 15
- F. Other Information 15
- G. Signatory Requirements 15
- H. Penalties for Falsification of Reports 16
- I. Availability of Reports 17
- J. Property Rights 17
- K. Severability 17
- L. Transfers 17
- M. State Laws 17
- N. Reopener Provision 17

Attachments
- Appendix A Assessment of Acidification Potential 2011_Rev1
- Appendix B Compliance and Operational Monitoring Plan 2011_Rev1
- Appendix C Pipeline Inspection Plan 2011_Rev1

I. SPECIFIC PERMIT CONDITIONS

A. Ground Water Classification and Protection Levels

The ground water classification for the uppermost aquifer in the area of the Tailings Impoundment ranges from Class II Drinking Water Quality to Class IV Saline ground water, with ground water near the Oquirrh Mountains recharge area generally Class II and water adjacent to the Great Salt Lake discharge area generally Class IV. Ground water at each compliance monitoring well has been classified based on historical monitoring data.

Compliance monitoring points and ground water Protection Levels for this permit are provided in Table 1. Protection levels are based on background sampling performed to date and the criteria of R317-6-4. Protection Levels are based on the greater of the protection level or the compliance limit (mean background plus twice the standard deviation). Protection levels for any new or replacement compliance monitoring wells approved by the Division and installed during the term of this permit will be set following an accelerated quarterly sampling program.

B. Best Available Technology Performance Standard

1. Best Available Technology for the Tailings Impoundment will be a Discharge Minimization approach operated in accordance with the approved engineering designs and specifications.

2. The Tailings Impoundment is comprised of two sections: an older South Impoundment and a North Impoundment. Active tailings disposal occurs only in the North Impoundment. Tailings disposal into the South Impoundment ceased in October 2002. Only Mine Waste materials that originate from the Bingham Canyon Mine and related processing waste as outlined in Part I.D may be disposed of in the Tailings Impoundment unless prior approval for disposal of other waste streams is obtained from the Executive Secretary.

   South Impoundment - The Lake Bonneville Clay (Bonneville Clay) is a low-permeability lacustrine clay layer varying from 9 to 15 feet thick that underlies over 90% of the existing impoundment. The Bonneville Clay serves as a natural liner for the impoundment. A radial discharge capture ditch system exists for most of the South Impoundment to route lateral seepage from the tailings back into the process water network for recycle or for discharge under UPDES Permit No. UT0000051.

North Impoundment - The entire North Impoundment area is underlain by the Bonneville Clay. This low-permeability lacustrine clay layer serves as a natural liner for the North Impoundment. A 36-inch finger drain system consisting of crushed slag placed between filter material has been placed in the base of the impoundment. This drain layer will promote horizontal seepage of process water through the embankment and into the perimeter toe drain collection ditch and reduce, somewhat, the potential for vertical migration of tailings waters. The collection ditch around the perimeter of the North Impoundment is utilized to capture lateral seepage from the blanket drain and route waters back into the process water makeup system.

Diving Board Area - This area is contained by earthen dikes composed of low-permeability native materials and is underlain by the low-permeability lacustrine clays typical of this area. Drainage from this area is collected via a ditch and channeled to the clarification canal.

3. Closure
Both the South and North sections of the Tailings Impoundment shall undergo closure in accordance with the requirements of the approved closure plan.

C. Permitted Facilities

The Facilities authorized under this permit include:

1. The South Impoundment near Magna, Utah;
2. The North Impoundment, located east of HWY 202 and south of I-80; and
3. The Diving Board Area, located south of State Road 201, and west of 9180 West.

D. Permitted Inflow Waste Streams

The waste streams that are permitted for placement in the existing and expansion portion of the Tailings Impoundment include:

1) Copper Tailings from the Copperton Concentrator;
2) Slag Tailings from the slag concentrator at the Smelter;
3) Power plant ash slurry;
4) Smelter process waters;
5) Wastewater effluent slurry from the Hydrometallurgical Plant at the Smelter;
6) Mine leach water and meteoric contact water that have been treated in the tailings pipeline;
7) Wastewater effluent from the Reverse Osmosis treatment of sulfate contaminated waters;
8) Neutralization of acid-mine contaminated waters;
9) Barneys Canyon pit dewatering and heap leach pad draindown waters;

10) Construction, maintenance and lunchroom trash;
11) Treated effluent from the sewage treatment plant; and
12) Other inflows that are approved by the Executive Secretary for this permit.

Kennecott shall obtain approval from the Executive Secretary prior to disposing of mine waste from ore, concentrate, or other materials that do not originate in the Bingham Canyon Mine or other listed waste streams. The use of off site anodes, scrap copper, reagents or materials to process ore, slag, or other materials does not trigger this requirement. The request to dispose of off site materials shall include characterization of the wastes using the Synthetic Precipitation Leaching Procedure (EPA SW846 Method 1312) for mining waste streams and the Toxicity Characteristic Leaching Procedure (EPA SW846 Method 1311) for non-mining waste streams. Further analysis may be required by the Executive Secretary to adequately characterize off site materials. Materials authorized for storage in Arthur Stepback Repository are described in U.S. EPA Record of Decision for Kennecott North and South Zone Sites, dated September 26, 2002.

E. Monitoring

1. General Provisions

a) *Future Modification of the Monitoring Network* - If at any time the Executive Secretary determines the monitoring program to be inadequate, Kennecott shall submit within 30 days of receipt of written notice from the Executive Secretary a modified monitoring plan that addresses the inadequacies noted by the Executive Secretary.

b) *Compliance Monitoring Period* - Monitoring shall commence upon issuance of this permit and shall continue through the life of this permit. For compliance monitoring wells that are installed during the term of this permit, monitoring shall commence upon completion of the well installation and development.

c) *Laboratory Approval* - All water quality analyses shall be performed by a laboratory certified by the State of Utah to perform such analysis.

d) *Water Level Measurement* - In association with each well sampling event, water level measurements shall be made in each monitoring well prior to removal of any water from the well bore. These measurements will be made from a permanent single reference point clearly marked on the top of the well or surface casing. Measurements will be made to the nearest 0.01 foot.

e) *Sampling Protocol* - Water quality samples will be collected, handled, and analyzed in conformance with the currently approved version of the Kennecott Ground Water Characterization and Monitoring Plan.

f) *Constituents Sampled* - The following analysis shall be performed on all water monitoring samples collected:

i) Field Measurements: pH, specific conductance, temperature.

ii) Laboratory Analysis:

- Total Dissolved Solids (TDS);
- Major Ions: chloride, sulfate, alkalinity, sodium, potassium, magnesium, and calcium; and
- Metals (dissolved): arsenic, barium, cadmium, chromium, copper, lead, selenium, silver, and zinc.

2. Operational Monitoring

Operational Monitoring will be used to assure inflows and interstitial waters are consistent with the approved BAT performance standards for this permit.

a) Tailings Waters - Kennecott shall characterize the quality of tailings waters by monitoring interstitial waters (within the tailings), water from the top of the impoundment, and other outflows such as seeps in accordance with the Compliance and Operational Monitoring Plan incorporated as Appendix B of this permit.

b) Monitoring of Inflows - Each inflow to the Tailings Impoundment listed in Section I Part D except solid waste such as Construction, maintenance and lunch room trash, shall be characterized using at a minimum the Synthetic Precipitation Leaching Procedure (SPLP) (EPA SW846 Method 1312) and total metals analysis. The details for monitoring of inflows are described in the Compliance and Operational Monitoring Plan (Appendix B).

c) Kennecott shall perform ongoing monitoring of tailings materials inflow for acid generation potential. These characterizations shall be performed in accordance with the Assessment of Acidification Potential Plan incorporated as Appendix A of this permit.

3. Monitoring Frequency

a) *Well Monitoring Frequency* - All existing compliance monitoring wells will be sampled according to the frequency listed in Table 1 of Appendix B throughout the term of this permit. All new and replacement compliance monitoring wells will be sampled quarterly over a three year period following installation to establish baseline ground water quality. Following completion of accelerated sampling, monitoring may change to a semiannual sampling frequency.

b) *Operational Monitoring Frequency* - Operational monitoring including monitoring of inflows shall occur semi-annually throughout the term of this permit, except for tailings underflow samples noted in Standard Operating Procedure #3 of Appendix A.

c) Radionuclides: Uranium, Radium 226, Radium 228, Gross Alpha, and Gross Beta Particle from monitoring wells NET1386 A&B, and NET1393 A&B shall be sampled once every five years prior to permit renewal. Analytical results shall be submitted in the ground water discharge permit renewal application.

d) South Impoundment lysimeters shall be sampled once every five years prior to permit renewal. Analytical results shall be submitted in the ground water discharge permit renewal application.

F. Demonstration of Compliance

1. Probable Out of Compliance for Ground Water Protection Levels - If the concentration of any pollutant exceeds the higher of the protection level or compliance limit (Table 1) in any compliance monitoring well, Kennecott shall:

a. Initiate monthly sampling for the well(s) that have exceeded the Permit Limit, unless the Executive Secretary determines that other periodic sampling is appropriate, for a period of two months or until the compliance status of the facility can be determined.

b. Notify the Executive Secretary of Probable Out of Compliance status in the corresponding semi-annual ground water report.

2. Out of Compliance Status for Ground Water Protection Levels

Out of compliance status exists when:

a. Two or more consecutive samples from a compliance monitoring well exceed one or more protection levels (Table 1); and

b. Two or more consecutive samples from the same compliance monitoring well exceed the compliance limit (Table 1) for that well: or

The concentration of any pollutant in two or more consecutive samples is statistically significantly higher than the applicable protection level. Statistical significance can be determined using methods described in Statistical Methods for Evaluating Ground Water Monitoring Data from Hazardous Waste Facilities, Vol. 53, No. 196 (Federal Register, Oct. 11, 1988)

c. Upon determining that an out of compliance situation exists, Kennecott shall:

i) Notify the Executive Secretary of the out of compliance status within 24 hours of detection followed by a written notice within 5 days of the detection.

ii) Initiate monthly sampling until the facility is brought into compliance unless the Executive Secretary determines that other periodic sampling is appropriate.

iii) Submit a Source Assessment and Compliance Schedule to the Executive Secretary within 30 days of determination of the out of compliance status that outlines the following:

- Steps of action that will assess the source, extent, and potential dispersion of the contamination.
- Evaluation of potential remedial actions to restore and maintain ground water quality and ensure the permit limits will not be exceeded at that compliance monitoring point.
- Measures to ensure best available technology will be re-established.

iv) Implement the Source Assessment and Compliance Schedule as directed by the Executive Secretary.

G. Non- Compliance for Best Available Technology

Kennecott is required to maintain the Best Available Technology in accordance with the approved design and practice for this permit. Failure to maintain BAT or maintain the approved design and practice shall be a violation of this permit. In the event a compliance action is initiated against the Permittee for violation of permit conditions relating to best available technology, Kennecott may affirmatively defend against that action by demonstrating the following:

a. Kennecott submitted notification in accordance with R317-6-6.13;

b. The failure was not intentional or caused by Kennecott's negligence, either in action or in failure to act;

c. Kennecott has taken adequate measures to meet permit conditions in a timely manner or has submitted for the Executive Secretary's approval, an adequate plan and schedule for meeting permit conditions; and

d. The provisions of UCA 19-5-107 have not been violated.

H. Reporting Requirements

1. Reporting

a. *Monitoring Wells* - Water quality sampling results for monitoring wells shall be submitted semi-annually to the Executive Secretary as follows:

Quarter Sampled In		Report Due On
1st	(Jan., Feb., March)	August 15
2nd	(April, May, June)	August 15
3rd	(July, Aug., Sept.)	February 15
4th	(Oct., Nov., Dec.)	February 15

b. *Electronic Filing Requirements* - The Permittee will submit the required ground water monitoring data in one of these electronic formats: adobe pdf, CD, or other approved transmittal mechanism.

c. *Operational Monitoring* - Operational monitoring results including interstitial waters, decant pond flows, tailings inflows, and acidification analysis shall be submitted in an annual report by March 31 of each year.

Failure to submit reports within the time frame due shall be deemed as noncompliance and may result in enforcement action.

I. Compliance Schedule

1. *Documentation of New and Replacement Well Installation*s - Within 60 days of completion of any new or replacement monitoring, Kennecott shall submit documentation on the wells demonstrating that each well is in conformance with the EPA RCRA Ground Water Monitoring Technical Enforcement Guidance Document, 1986, OSWER-9950.1 (RCRA TEGD) Section 3.5.

2. *Permit Renewal Application Items* - As a part of the application for permit renewal each five years, Kennecott will include water level data and a potentiometric surface map for both the shallow and principal aquifer systems within at least a one mile perimeter and underlying the impoundment. The water level data and maps will delineate temporal changes in water levels that have occurred during the term of the permit. Monitoring results for radionuclides and uranium in wells NET1386A&B and NET1393A&B

3. Within 90 days of permit issuance, Kennecott shall submit a process water pipeline inspection and preventative maintenance plan that will become Appendix C of this permit. Discussion of inspections, maintenance, replacements and spill avoidance measures should be included in the semi-annual monitoring report required by this permit. Follow-up reporting of any releases shall include an assessment of the loss of process water to soil and groundwater and an assessment of the potential impacts.

4. *Tailings Impoundment Closure Plan* - At any time during the effective period of this permit, Kennecott shall submit within 180 days of written request by the Executive Secretary, a revised closure plan for the existing and expansion portions of the Tailings Impoundment. The closure plan for the Tailings Impoundment is contained within "Reclamation and Water Management Plan, Kennecott Utah Copper Corporation, Bingham Canyon Mine" submitted in March 2003. Within three years of mine closure Kennecott must submit a final set of engineered drawings and plans that clearly define the scope of the final closure for the North and South portions of the Tailings Impoundment. The plan will provide details on all aspects of closure that are related to or have an impact on surface water or ground water quality, including all pre- and post-mine closure water sources. For any issues that require further study prior to finalizing aspects to the closure plan, details on what each study will include, and a schedule with milestones for each segment of the study shall be included in Kennecott's revised plan.

II. MONITORING, RECORDING AND REPORTING REQUIREMENTS

A. Representative Sampling Samples taken in compliance with the monitoring requirements established under Part I shall be representative of the monitored activity.

B. Analytical Procedures Water sample analysis must be conducted according to test procedures specified under UAC R317-6-6.3L, 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 for each monitoring period specified in the permit, shall be submitted to the Executive Secretary, Utah Division of Water Quality at the following address no later than 45 days after the end of the monitoring period:

Utah Division of Water Quality
P.O. Box 144870
Salt Lake City, Utah 84114-4870
Attention: Ground Water Protection Section

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 pollutant more frequently than required by this permit, using approved test procedures as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted. Such increased frequency shall also be indicated.

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 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 Executive Secretary at any time.

I. Twenty-four Hour Notice of Noncompliance and Spill Reporting

1. The Permittee shall verbally report any noncompliance, or spills subject to the provisions of UCA 19-5-114, which may endanger public health or the environment as soon as possible, but no later than twenty-four (24) hours from the time the Permittee first became aware of the circumstances. The report shall be made to the Utah Department of Environmental Quality 24 hour number, (801) 536-4123, or to the Division of Water Quality, Ground Water Protection Section at (801) 536-4300, during normal business hours (Monday through Thursday 7:00 am - 6:00 PM Mountain Time).

2. A written submission shall also be provided to the Executive Secretary 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.

3. 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.

K. Inspection and Entry The Permittee shall allow the Executive Secretary, 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 re-issuance, or modification; or for denial of a permit renewal application. The Permittee shall give advance notice to the Executive Secretary 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 is subject to a fine not exceeding $25,000 per day of violation. Any person convicted under Section 19-5-115(2) of the Act a second time shall be punished by a fine not exceeding $50,000 per day. 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.

IV. GENERAL REQUIREMENTS

A. Planned Changes. The Permittee shall give notice to the Executive Secretary as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required when the alteration or addition could significantly change the nature of the facility or increase the quantity of pollutants discharged.

B. Anticipated Noncompliance. The Permittee shall give advance notice 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 re-issuance, 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 must apply for and obtain a permit renewal or extension. The application should be submitted at least 180 days before the expiration date of this permit.

E. Duty to Provide Information. The Permittee shall furnish to the Executive Secretary, within a reasonable time, any information which the Executive Secretary 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 Executive Secretary, 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 Executive Secretary, it shall promptly submit such facts or information.

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

1. All permit applications shall be signed as follows:

   a. For a corporation: by a responsible corporate officer;
   b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.
   c. For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.

2. All reports required by the permit and other information requested by the Executive Secretary 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 Executive Secretary; and

   b. The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (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 Part 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 Part IV.G.2 must be submitted to the Executive Secretary 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 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 by the Permittee, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Executive Secretary. As required by the Act, permit applications, permits, effluent data, and ground water quality data shall not be considered confidential.

J. 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.

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

L. Transfers. This permit may be automatically transferred to a new Permittee if:

1. The current Permittee notifies the Executive Secretary at least 30 days in advance of the proposed transfer date;

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

3. The Executive Secretary 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.

M. 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, penalties established pursuant to any applicable state law or regulation under authority preserved by Section 19-5-117 of the Act.

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

1. If new ground water standards are adopted by the Board, the permit may be reopened and modified to extend the terms of the permit or to include pollutants covered by new standards. The Permittee may apply for a variance under the conditions outlined in R317-6-6.4.D.

2. If alternate compliance mechanisms are required.

3. If water quality of the facility is significantly worse than represented in the permit application.

4. If results from operational monitoring indicate acidification of the Tailings Impoundment is occurring or is likely to occur in the future or chemical makeup of the waste streams has changed significantly enough to effect a change in impacts to ground water.

5. If detections of radionuclides and uranium in NET1386A&B and NET1393A&B exceed Utah Ground Water Quality Standards.

6. If the Arthur Stepback Repository oversight currently provided by the EPA under the Consent Decree for the Kennecott North End Remedial Action ends and oversight is transferred to the Utah Department of Environmental Quality.

DWQ-2011-001007.doc

TABLE 1 Compliance Monitoring Well Protection Levels UGW350011

Parameter	Utah Ground Water Quality Standard (mg/L)	Monitoring Well **NEL532A** Class III				Monitoring Well **NEL532B** Class III			
		Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)	Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)
		mean	stdev			mean	stdev		
pH (units)	6.5-8.5	8.03	0.18	6.5 - 8.5		7.5	0.17	6.5 - 8.5	
Arsenic	0.05	0.199	0.033	0.200 [a]	0.265	0.243	0.024	0.243 a	0.292
Barium	2	0.144	0.084	1.000	0.312	1.45	0.12	1.00	1.73
Cadmium	0.005	nd	n/a	0.003	0.001	nd	n/a	0.003	0.001
Chromium	0.1	nd	n/a	0.050	0.010	nd	n/a	0.050	0.010
Copper	1.3	nd	n/a	0.650	0.020	0.017	0.013	0.650	0.043
Lead	0.015	nd	n/a	0.005	0.008	nd	n/a	0.005	0.008
Se (hydride)	0.05	nd	n/a	0.025	0.002	nd	n/a	0.025	0.002
Zinc	5	nd	n/a	2.50	0.010	0.021	0.018	2.50	0.057
Sulfate	-	715	275	1072	1264	70	13	105	95
TDS	3000	6977	412	8721	7800	7546	720	10000 b	8985

Parameter	Utah Ground Water Quality Standard (mg/L)	Monitoring Well **NEL536A** Class II				Monitoring Well **NEL536B** Class II			
		Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)	Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)
		mean	stdev			mean	stdev		
pH (units)	6.5-8.5	7.6	0.14	6.5 - 8.5		7.9	0.17	6.5 - 8.5	
Arsenic	0.05	0.04	0.008	0.050	0.056	0.021	0.008	0.027	0.037
Barium	2	0.159	0.017	0.500	0.192	0.070	0.017	0.500	0.105
Cadmium	0.005	nd	n/a	0.0013	0.001	nd	n/a	0.0013	0.001
Chromium	0.1	nd	n/a	0.025	0.010	nd	n/a	0.025	0.010
Copper	1.3	nd	n/a	0.325	0.020	nd	n/a	0.325	0.020
Lead	0.015	nd	n/a	0.005	0.008	nd	n/a	0.005	0.008
Se (hydride)	0.05	0.002	0.001	0.013	0.003	nd	n/a	0.013	0.002
Zinc	5	0.027	0.011	1.25	0.050	nd	n/a	1.25	0.010
Sulfate	-	322	36	402	394	50	7	63	64
TDS	3000	2151	449	2689	3000	794	33	993	860

Parameter	Utah Ground Water Quality Standard (mg/L)	Monitoring Well **NED604A** Class II				Monitoring Well **NED604B** Class II			
		Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)	Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)
		mean	stdev			mean	stdev		
pH (units)	6.5-8.5	7.31	0.16	6.5 - 8.5		7.65	0.12	6.5-8.5	
Arsenic	0.05	0.082	0.014	0.050 [a]	0.11	0.017	0.006	0.021	0.029
Barium	2	0.045	0.013	0.500	0.075	0.044	0.007	0.500	0.058
Cadmium	0.005	nd	n/a	0.0013	0.001	nd	n/a	0.0013	0.001
Chromium	0.1	nd	n/a	0.025	0.010	nd	n/a	0.025	0.010
Copper	1.3	nd	n/a	0.325	0.020	nd	n/a	0.325	0.020
Lead	0.015	nd	n/a	0.005	0.008	nd	n/a	0.005	0.008
Se (hydride)	0.05	nd	n/a	0.0125	0.002	nd	n/a	0.0125	0.002
Zinc	5	0.019	0.014	1.25	0.010	0.013	0.01	1.25	0.016
Sulfate	-	461	116	577	700	120	13	150	146
TDS	3000	2257	522	2821	3000	1271	53	1589	1377

TABLE 1 Compliance Monitoring Well Protection Levels UGW350011

Parameter	Utah Ground Water Quality Standard (mg/L)	Monitoring Well **NET646A** Class IV				Monitoring Well **NET646B** Class IV			
		Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)	Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)
		mean	stdev			mean	stdev		
pH (units)	6.5-8.5	6.95	0.18	6.5 - 8.5		7.3	0.13	6.5 - 8.5	
Arsenic	0.05	0.078	0.022	0.078 [a]	0.122	0.137	0.044	0.225	0.225
Barium	2	0.076	0.017	2.00	0.110	0.071	0.01	2.00	0.091
Cadmium	0.005	nd	n/a	0.005	0.001	nd	n/a	0.005	n/a
Chromium	0.1	0.019	0.007	0.100	0.033	0.015	0.005	0.100	0.025
Copper	1.3	0.084	0.025	1.300	0.134	0.093	0.104	1.300	0.301
Lead	0.015	nd	n/a	0.005	0.008	nd	n/a	0.005	0.008
Se (hydride)	0.05	0.003	0.001	0.050	0.002	0.005	0.004	0.050	0.013
Zinc	5	0.028	0.024	5.00	0.076	0.014	0.003	5.00	0.020
Sulfate	-	4276	1807	7890	7890	1159	144	1738	1447
TDS	3000	72000	20185	none	none	41920	2878	none	none

Parameter	Utah Ground Water Quality Standard (mg/L)	Monitoring Well **NET1380A** Class III				Monitoring Well **NET1380B** Class II			
		Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)	Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)
		mean	stdev			mean	stdev		
pH (units)	6.5-8.5	7.68	0.120	6.5 - 8.5		8.22	0.110	6.5 - 8.5	
Arsenic	0.05	0.012	0.005	0.025	0.022	nd	n/a	0.013	0.005
Barium	2	0.138	0.050	1.00	0.238	0.056	0.007	0.500	0.070
Cadmium	0.005	nd	n/a	0.003	0.001	nd	n/a	0.003	0.001
Chromium	0.1	0.015	0.006	0.050	0.010	nd	n/a	0.025	0.010
Copper	1.3	nd	n/a	0.650	0.020	nd	n/a	0.325	0.020
Lead	0.015	nd	n/a	0.005	0.008	nd	n/a	0.005	0.008
Se (hydride)	0.05	nd	n/a	0.025	0.002	nd	n/a	0.013	0.002
Zinc	5	0.013	0.006	2.50	0.010	nd	n/a	1.25	0.010
Sulfate	-	882	123	1300	1129	7	1.50	15	10
TDS	3000	5500	531	7500	6562	1226	55	1532	1336

Parameter	Utah Ground Water Quality Standard (mg/L)	Monitoring Well **NET1381A** Class III				Monitoring Well **NET1381B** Class III			
		Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)	Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)
		mean	stdev			mean	stdev		
pH (units)	6.5-8.5	7.84	0.14	6.5 - 8.5		7.5	0.16	6.5 - 8.5	
Arsenic	0.05	0.047	0.012	0.05	0.071	0.131	0.021	0.131 [a]	0.175
Barium	2	0.085	0.011	1.00	0.107	0.072	0.012	1.00	0.1
Cadmium	0.005	nd	n/a	0.003	0.001	nd	n/a	0.003	0.001
Chromium	0.1	nd	n/a	0.050	0.010	nd	n/a	0.050	0.010
Copper	1.3	nd	n/a	0.650	0.020	nd	n/a	0.650	0.020
Lead	0.015	nd	n/a	0.005	0.008	nd	n/a	0.005	0.008
Se (hydride)	0.05	nd	n/a	0.025	0.002	nd	n/a	0.025	0.002
Zinc	5	nd	n/a	2.50	0.010	nd	n/a	2.50	0.010
Sulfate	-	524	210	524	735	851	81	1277	1013
TDS	3000	5954	494	8000	6950	10863	979	10000 [b]	12800

TABLE 1 Compliance Monitoring Well Protection Levels UGW350011

Parameter	Utah Ground Water Quality Standard (mg/L)	Monitoring Well NET1382A Class III				Monitoring Well NET1382B Class III			
		Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)	Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)
		mean	stdev			mean	stdev		
pH (units)	6.5-8.5	7.92	0.21	6.5 - 8.5		8.27	0.170	6.5 - 8.5	
Arsenic	0.05	0.199	0.044	0.206 [a]	0.287	0.322	0.044	0.322 [a]	0.410
Barium	2	0.090	0.030	1.000	0.144	0.063	0.007	1.000	0.077
Cadmium	0.005	nd	n/a	0.003	0.001	nd	n/a	0.003	0.001
Chromium	0.1	nd	n/a	0.050	0.010	nd	n/a	0.050	0.010
Copper	1.3	nd	n/a	0.650	0.020	nd	n/a	0.650	0.020
Lead	0.015	nd	n/a	0.005	0.008	nd	n/a	0.005	0.008
Se (hydride)	0.05	nd	n/a	0.025	0.002	nd	n/a	0.025	0.002
Zinc	5	nd	n/a	2.50	0.010	nd	n/a	2.50	0.010
Sulfate	-	188	62	271	305	70	8	94	157
TDS	3000	4839	803	6050	6450	1789	80	2300	2050

Parameter	Utah Ground Water Quality Standard (mg/L)	Monitoring Well NET1382C Class III				Monitoring Well NET1387 Class II			
		Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)	Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)
		mean	stdev			mean	stdev		
pH (units)	6.5-8.5	8.51	0.180	6.5 - 8.5		7.37	0.120	6.5 - 8.5	
Arsenic	0.05	0.459	0.058	0.459 a	0.575	0.025	0.008	0.031	0.041
Barium	2	0.048	0.018	1.00	0.084	0.042	0.007	1.00	0.056
Cadmium	0.005	nd	n/a	0.003	0.001	nd	n/a	0.003	0.001
Chromium	0.1	nd	n/a	0.050	0.010	nd	n/a	0.025	0.010
Copper	1.3	nd	n/a	0.650	0.020	nd	n/a	0.325	0.020
Lead	0.015	nd	n/a	0.005	0.008	nd	n/a	0.005	0.008
Se (hydride)	0.05	nd	n/a	0.025	0.002	nd	n/a	0.013	0.002
Zinc	5	0.010	0	2.50	0.010	nd	n/a	1.25	0.010
Sulfate	-	64	7	96	78	319	32	400	383
TDS	3000	1354	193	2000	1741	1486	94	1858	1675

Parameter	Utah Ground Water Quality Standard (mg/L)	Monitoring Well NET1383A Class III				Monitoring Well NET1383B Class III			
		Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)	Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)
		mean	stdev			mean	stdev		
pH (units)	6.5-8.5	7.88	0.13	6.5 - 8.5		7.94	0.13	6.5 - 8.5	
Arsenic	0.05	0.220	0.029	0.220 [a]	0.278	0.22	0.037	0.220[b]	0.294
Barium	2	0.053	0.011	1.00	0.074	0.057	0.01	1.00	0.077
Cadmium	0.005	nd	n/a	0.003	0.001	nd	n/a	0.003	0.001
Chromium	0.1	nd	n/a	0.050	0.010	nd	n/a	0.050	0.010
Copper	1.3	0.03	0.01	0.650	0.05	nd	n/a	0.650	0.05
Lead	0.015	nd	n/a	0.005	0.008	nd	n/a	0.005	0.008
Se (hydride)	0.05	nd	n/a	0.025	0.002	nd	n/a	0.025	0.002
Zinc	5	nd	n/a	2.50	0.010	nd	n/a	2.50	0.010
Sulfate	-	218	29	327	276	186	14	279	215
TDS	3000	7067	162	8834	7391	6558	207	8192	6972

TABLE 1 Compliance Monitoring Well Protection Levels UGW350011

Parameter	Utah Ground Water Quality Standard (mg/L)	Monitoring Well **NET1384A** Class IV				Monitoring Well **NET1384B** Class IV			
		Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)	Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)
		mean	stdev			mean	stdev		
pH (units)	6.5-8.5	6.95	0.21	6.5 - 8.5		7.47	0.16	6.5 - 8.5	
Arsenic	0.05	0.063	0.025	0.063 [a]	0.113	0.187	0.051	0.187 [a]	0.29
Barium	2	0.043	0.02	2	0.083	0.026	0.007	2.00	0.04
Cadmium	0.005	nd	n/a	0.005	0.001	nd	n/a	0.005	0.001
Chromium	0.1	0.018	0.004	0.050	0.01	0.016	0.005	0.100	0.026
Copper	1.3	0.146	0.244	1.3	0.634	0.1	0.055	1.3	0.21
Lead	0.015	nd	n/a	0.005	0.008	nd	n/a	0.005	0.008
Se (hydride)	0.05	nd	n/a	0.05	0.002	nd	n/a	0.05	0.002
Zinc	5	0.024	0.021	5.0	0.066	0.017	0.012	5.00	0.040
Sulfate	-	2850	709	5000	4269	2110	132	3164	2375
TDS	3000	74843	9637	none	none	24000	914	none	none

Parameter	Utah Ground Water Quality Standard (mg/L)	Monitoring Well **NET1385A** Class III				Monitoring Well **NET1385B** Class III			
		Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)	Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)
		mean	stdev			mean	stdev		
pH (units)	6.5-8.5	7.95	0.12	6.5 - 8.5		7.78	0.15	6.5 - 8.5	
Arsenic	0.05	0.106	0.012	0.106 a	0.13	0.139	0.03	0.139 a	0.199
Barium	2	0.048	0.01	1.00	0.075	0.061	0.014	1.00	0.089
Cadmium	0.005	nd	n/a	0.003	0.001	nd	n/a	0.003	0.001
Chromium	0.1	nd	n/a	0.050	0.010	nd	n/a	0.050	0.010
Copper	1.3	0.028	0.01	0.65	0.05	0.026	0.007	0.65	0.040
Lead	0.015	nd	n/a	0.005	0.008	nd	n/a	0.005	0.008
Se (hydride)	0.05	nd	n/a	0.025	0.002	nd	n/a	0.025	0.002
Zinc	5	nd	n/a	2.5	0.010	nd	n/a	2.5	0.010
Sulfate	-	141	12	212	165	166	15	249	196
TDS	3000	4089	282	5112	4652	5839	202	7300	5839

Parameter	Utah Ground Water Quality Standard (mg/L)	Monitoring Well **NET1386A** Class IV				Monitoring Well **NET1386B** Class III			
		Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)	Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)
		mean	stdev			mean	stdev		
pH (units)	6.5-8.5	7.68	0.140	6.5 - 8.5		7.59	0.150	6.5 - 8.5	
Arsenic	0.05	0.012	0.009	0.018	0.030	0.057	0.007	0.057 [a]	0.077
Barium	2	1.330	0.140	2	1.161	0.214	0.032	1.00	0.278
Cadmium	0.005	nd	n/a	0.003	0.001	nd	n/a	0.003	0.001
Chromium	0.1	0.016	0.005	0.050	0.026	nd	n/a	0.050	0.010
Copper	1.3	0.040	0.015	0.650	0.070	nd	n/a	0.650	0.050
Lead	0.015	nd	n/a	0.005	0.008	nd	n/a	0.005	0.008
Se (hydride)	0.05	nd	n/a	0.025	0.002	nd	n/a	0.025	0.002
Zinc	5	0.016	0.006	2.50	0.028	nd	n/a	2.5	0.010
Sulfate	-	30	18	150	150	48	10	72	68
TDS	3000	10055	559	none	none	8396	426	10000 [b]	9248

TABLE 1 Compliance Monitoring Well Protection Levels UGW350011

Parameter	Utah Ground Water Quality Standard (mg/L)	Monitoring Well **NET1393A** Class IV				Monitoring Well **NET1393B** Class IV			
		Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)	Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)
		mean	stdev			mean	stdev		
pH (units)	6.5-8.5	7.65	0.17	6.5 - 8.5		7.55	0.17	6.5 - 8.5	
Arsenic	0.05	0.041	0.015	0.05 [b]	0.071	0.062	0.014	0.062 [a]	0.096
Barium	2	2.21	0.273	2.00 [b]	3.00	0.194	0.035	2.00 [b]	0.264
Cadmium	0.005	nd	n/a	0.005	0.001	nd	n/a	0.005	0.001
Chromium	0.1	nd	n/a	0.100	0.010	nd	n/a	0.100	0.010
Copper	1.3	nd	n/a	1.300	0.05	nd	n/a	1.300	0.05
Lead	0.015	nd	n/a	0.005	0.008	nd	n/a	0.005	0.008
Se (hydride)	0.05	0.024	0.013	0.050	0.05	nd	n/a	0.050	0.002
Zinc	5	nd	n/a	5.00	0.010	nd	n/a	5.00	0.010
Sulfate	-	52	18	150	150	97	19	150	150
TDS	3000	12123	363	none	none	10963	352	none	none

Parameter	Utah Ground Water Quality Standard (mg/L)	Monitoring Well **NET1490** Class II				Monitoring Well **NET1491** Class II			
		Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)	Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)
		mean	stdev			mean	stdev		
pH (units)	6.5-8.5	7.17	0.018	6.5 - 8.5		7.17	0.09	6.5 - 8.5	
Arsenic	0.05	0.005	0.001	0.013	0.007	0.006	0.001	0.013	0.008
Barium	2	0.04	0.007	0.500	0.055	0.023	0.003	0.500	0.029
Cadmium	0.005	nd	n/a	0.005	0.001	nd	n/a	0.003	0.001
Chromium	0.1	nd	n/a	0.025	0.025	nd	n/a	0.025	0.010
Copper	1.3	nd	n/a	0.325	0.325	nd	n/a	0.325	0.020
Lead	0.015	nd	n/a	0.005	0.008	nd	n/a	0.005	0.008
Se (hydride)	0.05	0.006	0.002	0.013	0.010	0.007	0.002	0.013	0.011
Zinc	5	0.015	0.015	1.25	0.051	nd	n/a	1.25	0.010
Sulfate	-	266	48	333	361	492	158	616	808
TDS	3000	1684	111	2105	1906	2780	251	3000 b	3000

Parameter	Utah Ground Water Quality Standard (mg/L)	Monitoring Well **NET1492** Class III			
		Background Level (mg/L)		Protection Level (mg/L)	Compliance Limit (mg/L)
		mean	stdev		
pH (units)	6.5-8.5	7.14	0.11	6.5 - 8.5	
Arsenic	0.05	nd	n/a	0.025	0.001
Barium	2	0.022	0.004	0.500	0.03
Cadmium	0.005	nd	n/a	0.003	0.001
Chromium	0.1	nd	n/a	0.050	0.010
Copper	1.3	nd	n/a	0.65	0.05
Lead	0.015	nd	n/a	0.005	0.008
Se (hydride)	0.05	0.006	0.002	0.025	0.010
Zinc	5	nd	n/a	2.5	0.010
Sulfate	-	629	118	943	865
TDS	3000	2998	342	3747	3682

nd = non-detect n/a = not applicable

Protection Level established by the greater of 1.X times the measured background concentration, or 0.X times the Ground Water Quality Standard

Compliance Limits are calculated from the mean of measured concentrations + 2 standard deviations, or method detection limit

Protection Level for Class IV well will be the Ground Water Quality Standard

a - Background value exceeds ground water standard; Protection Level = background (no net increase approach)

b - 1.X times background exceeds ground water quality standard; Protection Level = ground water quality standard

APPENDIX A

ASSESSMENT OF ACIDIFICATION POTENTIAL KENNECOTT TAILINGS IMPOUNDMENT (January 2011)

1.0 MONITORING OBJECTIVES

The objectives of this monitoring plan are as follows:

1. To characterize any potential water quality impacts resulting from potential future acidification of tailings material.

2. To accurately predict the acidification potential that will occur on the impoundment.

3. To present an adequate characterization of acidification potential for the different units of both the existing and expansion portion of the Tailings Impoundment.

2.0 MONITORING PLAN

2.1 Acidification Monitoring

The primary objective of this portion of the monitoring program is to determine the acidification potential of both the existing and expansion portions of the tailings impoundment, using acid/base accounting (ABA) and Net Acid Generation (NAG) testing (Table 1).

2.1.1 Sampling Locations

The Tailings North Expansion embankment is constructed of coarse underflow material from two cyclone stations (designated East and West Cyclones). The fine-grained overflow material is placed in the interior of the impoundment. The East Cyclone station currently receives material only from the Copperton Concentrator. The West Cyclone Station currently receives Copperton tailings, Power Plant fly ash and inputs from the Smelter slag and hydrometallurgical tailings. In the future, Smelter process waters may be directed to the West Cyclone station as well.

Both slag tailings and the power plant ash contain abundant neutralizing capacity, so there is little to no risk of acid generation from these materials. Hydrometallurgical tailings comprise <0.5% of the flow entering the impoundment from the West Cyclone Station. The West Cyclone Station material is sampled after all of the tailings streams have been mixed and cycloned in the overflow and underflow samples.

The exterior of the existing south impoundment has been adequately characterized by previous sampling efforts. Sampling locations to characterize the active North Impoundment include the following sites, to be sampled at the frequencies indicated in section 2.1.2.

I. Embankment of the North Impoundment (cycloned tailings underflow)

II. Interior of North Impoundment (cycloned tailings overflow)

2.1.2 Sampling and Analysis for ABA Values

Samples will routinely be collected from a depth interval of 0 to 12 inches for tailings that are in place. However, additional samples may be taken from other depths for evaluation of areas of incipient acidification.

SOP #3 describes the standard protocol for sampling, preservation, chain of custody and archiving of samples. All samples will be archived for at least two years. The locations of the samples from the existing impoundment will be marked in the field with a stake and will be indicated on a reference map.

2.1.2.1 Whole Tailings

A. Copperton Tailings (BCP1483) – A quarterly grab sample will be collected from this tailings stream.

B. Hydromet/Slag Tailings (TLP2593) – A semi-annual grab sample will be collected from this tailings stream

C. North Splitter Box (MCP2536) – A quarterly grab sample will be collected from this tailings stream.

2.1.2.2 Underflow Material in North Embankment

Grab samples of underflow tailings (TLP1485 and TLP1487) will be collected quarterly from each cyclone station (two samples per quarter). The samples will be collected as the underflow is discharged from the cyclone.

2.1.2.3 Overflow Material in the North Impoundment

Grab samples of overflow tailings (TLP1486 and TLP1488) will be collected semi-annually from each cyclone station (two samples every six months). The samples will be collected as the overflow material is discharged from the cyclone.

2.1.3 Testing Methods and Parameters

Samples of tailings solids will be analyzed using methods described in detail in the attached Standard Operating Procedures listed in section 4.0 (SOP's 1, 2, 3 and 4).

2.1.3.1 Static Testing

Samples of tailings solids will be analyzed for acid/base accounting using the protocol for ABA potential in SOP #1.

2.1.3.2 Kinetic Testing

The humidity cell kinetic testing protocol is listed in SOP #2. Routine humidity cell testing has been discontinued but the SOP has been retained in case the test is used on a discretionary basis in the future. The humidity cell test results are of limited usefulness because the kinetics of the sulfide oxidation and acid/base reactions in the test cells are very slow, and no tailings materials ever acidified (even those tested for over a year.) The test results could not be used to predict if a tailings sample would generate acid rock drainage in the future. To overcome this problem, kinetic Net Acid Generation (NAG) testing has been substituted for the humidity cells.

The protocol for the NAG test is listed in SOP #4. The kinetic NAG test involves the addition of a strong oxidizing agent, hydrogen peroxide, to the tailings sample. The hydrogen peroxide oxidizes the available sulfide in the sample at a rapid rate, mimicking years or decades of surface weathering in a matter of hours.

A minimum of six kinetic NAG tests will be completed each year. The tests will be run on samples that have been analyzed by acid/base accounting techniques (SOP #1). The samples will be selected to provide a data set with a broad range of ABA potentials and neutralization potential ratios; however testing emphasis will be placed on samples with NNP values of ±10; the acidification of these samples are typically less predictable.

2.1.4 Quality Assurance

Replicate Samples: Split replicate samples will be included to evaluate the precision of the analyses. At least one replicate sample will be analyzed for every 20 samples (5%). Results will be acceptable if the Relative Percent Differences (RPD) of the ABA values differ by less than 35%.

Reference Samples: A large quantity of Kennecott underflow tailings sample has been collected, dried, homogenized, and archived as a reference material. The reference sample is a composite sample of tailings underflow material that has been thoroughly mixed and split into individual samples. (This is the same material as was used in the previous evaluation of the acidification potential of the tailings). Samples of the reference tailings material will be submitted to the analytical laboratory, together with the unknown samples, to determine the precision and consistency of the laboratory analyses. One reference sample will be submitted per 20 unknown samples. The results will be compared to those obtained for the same reference material in the previous evaluation of potential acidification (Shepherd Miller, Inc. and Schafer and Associates, 1995). If the RPD is within ± 1.5 standard deviations about the mean relative to past results for the same reference materials, the results will be accepted.

2.1.5 Inspection of Tailings North Impoundment Embankment

Annual inspection of the North Embankment will be conducted to visually identify potential "hot-spots." If acidification appears to be developing based upon changes in color or lack of previously cultivated vegetation, the approximate outlines of the site will be marked on a map and a sample collected for soil paste pH and paste conductivity.

2.2 Operational Monitoring

The operational monitoring will be conducted as outlined in Kennecott's Operational Monitoring Plan (see Appendix B)

3.0 REPORTING

An annual report will be submitted by March 31 addressing the previous years monitoring as described in this plan and Appendix B.

The report will include:

- summary tables of the results of the ABA analyses and the analyses of the final kinetic NAG test leachate,
- graphs showing the pH and temperature variation during the kinetic NAG tests,
- a comparison of the past year's geochemical data with the preceding years,
- a comparison between the ABA and kinetic test results (In particular, at what ABA potential and neutralization potential ratio the tailings will acidify),
- a summary of the results of the North Embankment inspection including a map of any areas that have acidified.

- a summary of all surface water, seep, lysimeter and groundwater data collected in accordance with Appendix B.

4.0 STANDARD OPERATING PROCEDURES (SOP's)

The following SOP's are attached to this plan:

1. Standard Operating Procedure #1 – The Complete Modified Sobek Acid Base Accounting.

2. Standard Operating Procedure #2 – Kinetic Testing by the Humidity Cell Procedure.

3. Standard Operating Procedure #3 – Sample Collection, Preservation, Chain of Custody, Archiving, and Quality Assurance.

4. Standard Operating Procedure #4 – Kinetic Testing by the Net Acid Generation (NAG) Procedure.

Table 1
Repeat Sample Description

Sample ID	Location	Frequency[1]	Sample Source	Material Type	Analysis Required
BCP1483	Copperton	Quarterly	Sampling Crew	Tailings	ABA, MC
MCP2536	North Splitter Box	Quarterly	Sampling Crew	Tailings	ABA, MC
TLP2593	Smelter Slag/Hydromet	Semi-annual	Sampling Crew	Smelter Tailings	ABA, MC, Total Metals, SPLP
TLP1485	Tailings (East Cyclone)	Quarterly	Sampling Crew	Cycloned Tailings Underflow	ABA, MC, Total Metals, SPLP
TLP1486	Tailings (East Cyclone)	Semi-Annually	Sampling Crew	Cycloned Tailings Overflow	ABA, MC, Total Metals, SPLP
TLP1487	Tailings (West Cyclone)	Quarterly	Sampling Crew	Cycloned Tailings Underflow	ABA, MC, Total Metals, SPLP
TLP1488	Tailings (West Cyclone)	Semi-Annually	Sampling Crew	Cycloned Tailings Overflow	ABA, MC, Total Metals, SPLP

Notes:
[1]Frequency listed for ABA samples, total metals and SPLP analysis are performed semi-annually on all samples.

Abbreviations:
ABA = Acid/Base Accounting
MC = Moisture Content
SPLP = Synthetic Precipitation Leach Procedures

APPENDIX B

COMPLIANCE AND OPERATIONAL MONITORING PLAN

GROUND WATER DISCHARGE PERMIT
PERMIT NO. UGW350011
(January 2011)

1.0 INTRODUCTION

This plan presents the sampling, analyses, and quality guidelines for the sampling of operational process discharges to the Tailings Impoundment. Sampling is being done to assure that the tailings inflows and interstitial water within the impoundment are consistent with the Best Available Technology (BAT) performance standards approved in the Tailings Impoundment Ground Water Discharge Permit No. UGW350011. This document satisfies the requirements of Part 1.E.2a and 2b of the permit. This monitoring plan complements the plan for Assessment of Acidification Potential (Appendix A) prepared to satisfy the requirements of Part I.H.1b of the permit.

2.0 MONITORING

Tailings water to be monitored under this plan will characterize the interstitial waters (within the tailings), and seeps. Groundwater monitoring wells located around the perimeter of the impoundment will be monitored to observe trends in local groundwater and determine compliance. Table 1 details the locations and frequency of required monitoring points described in this section. Tailings slurry solids will also be monitored.

2.1 Tailings Water Samples

Tailings water samples will be collected from surface water sites and wells completed within the tailings footprint.

2.1.1 Surface Water Sites

Surficial tailings water samples will be collected from the following locations:

- Clarification Canal (sampling site CLC452) – This site will be sampled quarterly and was selected to show the quality of the tailings water as it returns from the top of the Tailings Impoundment. This location is unaffected by other discharges to the clarification canal and represents nearly the entire return flow from the impoundment. Additionally, this site has a sampling history dating back to 1991 and is near the 001 UPDES Outfall.

- Toe Collection Ditch (sampling sites TLP1436, and TLP1469) - Will be sampled quarterly. Site TLP1436 is located in the toe collection ditch near the 007 UPDES Outfall and site TLP1469 is located adjacent to the Gypstack.

- Seeps (sampling sites TLS1426) – These seeps are located on the Tailings Impoundment embankment and have been sampled intermittently since 1985. Samples of these seeps will be collected twice per year, once in the spring and in the late summer or early fall. Some of these seeps will eventually be covered with tailings; sampling will be discontinued at that time. The discovery of any new seeps within the tailings embankment should also be sampled and reported in the annual report.

- Waste Water Treatment Plant (sampling point WTS1489) – This site no longer discharges water to the Tailings Impoundment. Should discharges from this site resume, grab samples will be collected from this site quarterly as long as the effluent from the WWTP is discharged directly to the Tailings Impoundment.

The locations of these sampling sites are shown on Figure 1. Samples will be collected using the procedures provided in Kennecott's Standard Operating Procedures for Water Sampling. Protocols for handling samples and obtaining analyses will be as specified for ground water samples in the Ground Water Characterization and Monitoring Plan (GCMP).

2.1.2 Tailings Wells

Tailings wells TLT887, TLT2452, TLT2575A, TLT2575B and NET2596 will be sampled semi-annually. These wells are constructed within the tailings and were selected to include wells located in various portions of the impoundment, both laterally and vertically. The locations of these wells are shown on Figure 1.

Samples collected from these wells will be collected using sampling methods and protocols specified in the GCMP. New well construction will be done as specified in the GCMP.

2.1.3 Compliance Wells

Compliance wells will be sampled according to the schedule listed Table 1. The compliance wells are located around the perimeter of the Tailings Impoundment complex and are completed in the aquifer system that ranges from Class II to Class IV. Additional monitoring and reporting requirements for non-compliance conditions are described in Part I, Section H of the permit. If the concentration of any pollutant exceeds the Compliance Limit (Table 3) in any compliance monitoring well, Kennecott will initiate monthly sampling for the well(s) that have exceeded the Compliance Limit. Monthly sampling will continue for two months or until the compliance of the facility can be

determined. Notification to the Executive secretary will be made in the corresponding semi-annual report.

Compliance monitoring wells will be analyzed for those constituents listed in section 2.1.5 below. However, compliance will be determined based on the following parameters: pH, arsenic, barium, cadmium, chromium, copper, selenium, zinc, sulfate and TDS.

2.1.4 Lysimeters at the Magna Tailings Impoundment were installed to help determine the behavior of the tailings over time. A lysimeter is an instrument for collecting pore water that percolates through a certain depth of unsaturated soil. Nests of 2-4 lysimeters were installed at three locations on the Magna Tailings Impoundment, which were then included as operational monitoring sites in groundwater discharge permit #UGW350011 (Table 2). Lysimeter samples will be analyzed for the same list of analytes except for TDS. Lysimeter samples produce a limited sample volume, less than 250 mL, and frequently may not produce a sample sufficient to allow a complete suite of analyses on an annual basis. This is a result of soil conditions that cannot be prevented. When insufficient sample volume is present, only a limited number of parameters may be analyzed. The priority for sample analysis will be pH, trace metals and then major ions. Tailings lysimeters will be sampled every five years on the year prior to permit renewal (next sample in 2015).

2.1.5 Analytes and Analytical Methods

All surface and tailings well samples will be analyzed for pH, conductivity, Total Dissolved Solids (TDS), Total Suspended Solids (TSS), sulfate, chloride, alkalinity, sodium, potassium, magnesium, calcium, arsenic, cadmium, chromium, copper, iron, lead, selenium, silver, and zinc. Water levels will be measured immediately prior to collection of samples from the tailings wells.

The methods used for analyses will be those specified in Table QAPP-2 of the Quality Assurance Project Plan for the Ground Water Characterization and Monitoring Plan (QAPP-GCMP).

2.1.6 Quality Assurance

The quality assurance program for these samples will be as specified in the QAPP-GCMP. This requires a minimum of 20% duplicate, spike, spiked duplicate, equipment and trip blanks. The precision and accuracy objectives will be those specified in Table QAPP-1 of the QAPP-GCMP.

2.2 Solid Samples

2.2.1 Sample Collection

Solid samples will be collected semi-annually to characterize the metals content and metals solubility of materials discharged to the Tailings Impoundment. A total of five samples will be analyzed every six months:

- West cyclone underflow tailings (TLP1485 - quarterly)
- West cyclone overflow tailings (TLP1486 - semiannual)
- East cyclone underflow tailings (TLP1487 - quarterly)
- East cyclone overflow tailings (TLP1488 - semiannual)
- Smelter slag/hydromet tailings (TLP2593 - semiannual)

The Tailings North Tailings embankment is constructed of coarse underflow material from two cyclone stations (designated East and West Cyclones). The fine-grained overflow material is placed in the interior of the impoundment. The East Cyclone station currently receives material only from the Copperton Concentrator. The West Cyclone Station currently receives Copperton tailings, Power Plant fly ash and smelter slag/hydromet tailings. In the future, Smelter process waters may be directed to the West Cyclone station as well.

2.2.2 Analysis and Analytical Methods

All of the solid samples will be analyzed for the following constituents:

- Total Metals – As, Cd, Cr, Cu, Pb, Se and Zn,
- SPLP – As, Cd, Cr, Cu, Pb, Se and Zn.

Total metals analysis will be conducted according to EPA SW846 Method 6010 or 6020. SPLP analysis will be conducted according to EPA SW846 Method 1312.

2.2.3 Quality Assurance

The quality assurance program for these samples will require a minimum rate of 20% for duplicate, spike, spiked duplicate, and blank samples. The precision objectives will require duplicate samples to have Relative Percent Differences (RPD) of less than 25%. Accuracy objective will be spike recoveries between 65% and 135%. Blank samples will show no concentrations above the detection limit. The completeness goal is 100%.

3.0 REPORTING

Results of the water samples and the solid sampling will be reported in the annual monitoring report required and described in Appendix A.

TABLE 1 - SAMPLE SCHEDULE AND WELL CONSTRUCTION DETAILS

DESCRIPTION	SAMPLE IDENTIFICATION	SAMPLE FREQUENCY	NORTHING[1]	EASTING[1]	ELEVATION GROUND (ft amsl)[2]	ELEVATION MARK (ft amsl)[2]	CASING DIAMETER (ft)	SCREEN TOP (ft)	SCREEN BOTTOM (ft)	WELL DEPTH (ft)
Surface Water	CLC452	quarterly	7430598	1478952	NA	NA	NA	NA	NA	NA
Toe Ditch	TLP1436	quarterly	7449537	1472811	NA	NA	NA	NA	NA	NA
	TLP1469	quarterly	7443912	1456331	NA	NA	NA	NA	NA	NA
Seeps	TLS1426	semiannual (if flowing)	7430584	1469199	NA	NA	NA	NA	NA	NA
Tailings Wells	NET2596	semiannual	7432501	1475907	4382.23	0.00	0.208	123.0	133.0	135.00
	TLT887	semiannual	7437118	1456907	0.00	NA	NA	NA	NA	NA
	TLT2575B	semiannual	7435211	1476230	0.00	0.00	0.208	233.0	245.0	247.00
	TLT2575A	semiannual	7435232	1476230	0.00	4385.20	0.333	171.0	181.0	177.15
	TLT2452	semiannual	7438543	1478307	NA	0.00	0.000	19.0	0.0	201.00
Compliance Wells	NEL532A	semiannual	7434362	1478810	4225.52	4226.87	0.130	11.0	16.0	19.43
	NEL532B	semiannual	7433998	1478790	4226.53	4226.48	0.130	38.0	43.0	46.00
	NEL536A	annual	7431812	1478851	4231.35	4233.68	0.130	10.3	15.3	17.55
	NEL536B	annual	7431448	1478830	4231.21	4232.66	0.130	34.7	39.7	41.60
	NED604A	semiannual	7429873	1471526	4251.69	4254.76	0.170	15.0	25.0	26.42
	NED604B	semiannual	7429335	1471523	4251.89	4254.74	0.170	65.0	80.0	79.95
	NET646A	semiannual	7447372	1458412	4212.93	4215.33	0.170	5.0	15.0	17.93
	NET646B	semiannual	7447038	1458153	4212.90	4215.37	0.170	39.6	49.6	51.73
	NEM1387	semiannual	7430720	1472930	4245.02	4247.76	0.208	10.0	20.0	21.00
	NET1380A	semiannual	7437100	1454702	4226.14	4227.98	0.208	13.5	23.5	24.50
	NET1380B	annual	7437095	1454707	4226.32	4228.09	0.208	54.0	64.0	65.00
	NET1381A	semiannual	7443041	1479775	4220.39	4222.31	0.208	25.0	35.0	36.00
	NET1381B	semiannual	7443036	1479750	4220.21	4222.21	0.208	44.0	54.0	55.00
	NEL1382A	semiannual	7437371	1480785	4224.20	4225.81	0.208	10.0	20.0	21.00
	NEL1382B	semiannual	7437371	1480785	4224.27	4226.61	0.208	29.0	39.0	40.00
	NEL1382C	semiannual	7437371	1480785	4224.42	4226.51	0.208	88.0	98.0	100.00
	NET1383A	semiannual	7449638	1473603	4214.85	4217.45	0.208	14.0	24.0	25.00
	NET1383B	semiannual	7449659	1474064	4215.49	4217.55	0.208	34.0	44.0	45.00
	NET1384A	semiannual	7449093	1466595	4215.93	4217.94	0.208	13.0	23.0	25.00

TABLE 1 - SAMPLE SCHEDULE AND WELL CONSTRUCTION DETAILS (cont.)

DESCRIPTION	SAMPLE IDENTIFICATION	SAMPLE FREQUENCY	NORTHING[1]	EASTING[1]	ELEVATION GROUND (ft amsl)[2]	ELEVATION MARK (ft amsl)[2]	CASING DIAMETER (ft)	SCREEN TOP (ft)	SCREEN BOTTOM (ft)	WELL DEPTH (ft)
Compliance Wells	NET1385A	semiannual	7446677	1477638	4215.65	4217.94	0.208	14.5	24.5	25.00
	NET1385B	semiannual	7446252	1478003	4215.70	4218.16	0.208	60.0	70.0	71.00
	NET1386A	annual	7441038	1454228	4216.96	4218.67	0.208	29.0	39.0	40.00
	NET1386B	annual	7440466	1453934	4217.05	4218.84	0.208	61.0	71.0	72.00
	NET1393A	semiannual	7443665	1455650	4218.86	4220.68	0.208	29.0	39.0	40.00
	NET1393B	semiannual	7443665	1455650	4219.07	4220.98	0.208	58.0	68.0	70.00
	NET1490	semiannual	7432489	1459150	4333.84	4334.99	0.208	105.4	124.9	130.00
	NET1491	semiannual	7432962	1459180	4340.87	4343.67	0.208	125.8	145.0	149.93
	NET1492	semiannual	7433416	1459256	4346.84	4244.32	0.208	107.4	127.2	128.98
Lysimeters	TLL4100	Every fifth year (2015)	7432117	1473740						
	TLL4101	Every fifth year (2015)	7432117	1473740						
	TLL4102	Every fifth year (2015)	7432117	1473740						
	TLL4103	Every fifth year (2015)	7432117	1473740						
	TLL4128	Every fifth year (2015)	7438687	1459223						
	TLL4129	Every fifth year (2015)	7438687	1459223						
	TLL4133	Every fifth year (2015)	7430575	1456506						
	TLL4134	Every fifth year (2015)	7430575	1456506						
	TLL4135	Every fifth year (2015)	7430575	1456506						

1. Northing and Easting Coordinates in State Plane NAD83
2. Elevations use NGVD29
3. All samples will be analyzed for pH, conductivity, TDS (except lysimeters), TSS, sulfate, chloride, alkalinity, sodium, potassium, magnesium, calcium, arsenic, cadmium, chromium, copper, sulfate, iron, lead selenium, silver and zinc.

TABLE 2 - Lysimeter Depths

Lysimeter	Depth (ft.)	Lysimeter	Depth (ft.)	Lysimeter	Depth (ft.)
TLL4100	4	TLL4128	2	TLL4133	3
TLL4101	8	TLL4129	5	TLL4134	5
TLL4102	12			TLL4135	7
TLL4103	20				