UTAH DIVISION OF AIR QUALITY
SOURCE PLAN REVIEW

Chris Kaiser
Kennecott Utah Copper LLC
4700 Daybreak Parkway
South Jordan, UT 84095

Project Number: N105720029

RE:	Modification of AO DAQE-AN0572018-06 for the Expansion of the Tailings Impoundment Salt Lake County; CDS A; PM_{10} SIP / Maint Plan, Nonattainment or Maintenance Area, Title V (Part 70) major source,
Review Engineer:	Nando Meli Jr.
Date:	February 12, 2014
Notice of Intent Submitted:	December 19, 2011
Plant Contact:	Chris Lilley
Phone Number:	(801) 204-2134
Fax Number:	(801) 204-2888
Source Location:	11984 West Highway 202, Magna, UT Salt Lake County 4,513,000 m Northing, 405,000 m Easting, UTM Zone 12 UTM Datum: NAD27

DAQ requests that a company/corporation official read the attached draft/proposed Plan Review with Recommended Approval Order Conditions. If this person does not understand or does not agree with the conditions, the review engineer should be contacted within five days after receipt of the Plan Review. If this person agrees with the Plan Review and Recommended Approval Order Conditions, this person should sign below and return (FAX # 801-536-4099) within 10 days after receipt of the conditions. If the review engineer is not contacted within 10 days, the review engineer shall assume that the company/corporation official agrees with this Plan Review and will process the Plan Review towards final approval. A public comment period will be required before the Approval Order can be issued.

Applicant Contact _____
(Signature & Date)

OPTIONAL: In order for this Source Plan Review and associated Approval Order conditions to be administratively included in your Operating Permit (Application), the Responsible Official as defined in R307-415-3, must sign the statement below and the signature above is not necessary. THIS IS STRICTLY OPTIONAL!

If you do not desire this Plan Review to be administratively included in your Operating Permit (Application), only the Applicant Contact signature above is required. Failure to have the Responsible Official sign below will not delay the Approval Order, but will require a separate update to your Operating Permit Application or a request for modification of your Operating Permit, signed by the Responsible Official, in accordance with R307--415-5a through 5e or R307-415-7a through 7i.

"Based on reasonable inquiry, I certify that the information provided for this Approval Order has been true, accurate and complete and request that this Approval Order be administratively amended to the Operating Permit (Application)."

Responsible Official _____
(Signature & Date)

Print Name of Responsible Official _____

ABSTRACT

Kennecott Utah Copper (KUC) has requested approval to expand the existing Tailings site. As part of the expansion plan, the Tailings site is being redesigned in two Phases to handle a total of 2.2 billion tons of tailings storage. To achieve this required storage amount, modifications to the existing operation are proposed along with an increase in the overall Tailing's site footprint. The first phase of construction will consist of a new expansion to the northeast of the existing Tailing site. When this Northeast Impoundment is combined with the existing North Impoundment, the total footprint will be approximately 4,490 acres. The final phase will consist of raising the North Impoundment and combining it with a portion of the South Impoundment. This will result in a total foot print area of approximately 10,190 acres. Infrastructure modifications and equipment relocations will be required during the proposed expansion project.

Salt Lake County is a Non-attainment area of the National Ambient Air Quality Standards (NAAQS) for PM_{10}, $PM_{2.5}$ and SO_2, and is a Maintenance area for Ozone. The Tailings Impoundment is listed in Section IX, Part H, Subpart 2.i(2) of the PM_{10} SIP. Title V of the 1990 Clean Air Act applies to this source. The fugitive emission increases associated with the Tailings site expansion (in TPY) are estimated as follows: PM_{10} = 46.79, $PM_{2.5}$ = 7.10. The PTE for all sources associated with the Tailings site will be as follows: PM_{10} (including $PM_{2.5}$) = 83.05, $PM_{2.5}$ = 12.58, NO_x = 0.28, CO = 1.12, VOC = 0.04, and CO_2e = 20.04. In accordance with R307-403-5, the increase in PM_{10} emissions of 46.79 TPY from the Tailings and the increase from the Bonneville Borrow Plant combined together will be over 50 TPY, and they will be offset at a ratio of 1.2:1. Offsets held in the Emission Credit Registry by KUC will be relinquished prior to the issuance of the AO.

SOURCE SPECIFIC DESIGNATIONS

Applicable Programs:

PM_{10} SIP / Maint Plan applies to Plantwide

Title V (Part 70) major source applies to Plantwide

Salt Lake County O3 Maintenance Area applies to Plantwide

Salt Lake County PM_{10} NAA applies to Plantwide

Salt Lake County $PM_{2.5}$ NAA applies to Plantwide

Salt Lake County SO_2 NAA applies to Plantwide

Permit History:

When issued, the approval order shall supersede or will be based on the following documents:

Incorporates	Additional Information dated October 31, 2013
Incorporates	Additional Information dated September 16, 2013
Incorporates	Additional Information dated August 15, 2013

Incorporates	Additional Information dated August 5, 2013
Incorporates	Additional Information dated July 1, 2013
Incorporates	Additional Information dated June 19, 2013
Incorporates	Additional Information dated February 7, 2013
Incorporates	Additional Information dated September 17, 2012
Incorporates	Additional Information dated August 9, 2012
Incorporates	Additional Information dated May 21, 2012
Incorporates	Additional Information dated December 28, 2011
Is Derived From	Notice of Intent dated December 19, 2011
Supersedes	DAQE-AN0572018-06 dated April 6, 2006

Nonattainment or Maintenance Areas Impacted:

Salt Lake County O3 Maintenance Area
Salt Lake County PM_{10} NAA
Salt Lake County $PM_{2.5}$ NAA
Salt Lake County SO_2 NAA

SUMMARY OF NOTICE OF INTENT INFORMATION

Description of Proposal:

KUC has redesigned the Tailings site that will be constructed in two phases to handle a total of 2.2 billion tons of tailings storage. To achieve this required storage amount, modifications to the existing operation are proposed along with an increase to the overall footprint. The first phase of construction will consist of a new expansion to the Northeast of the existing site. When this Northeast expansion is combined with the existing site, the total footprint will be approximately 4,490 acres. The final phase will consist of raising the North section and combining it with a portion of the South section. This will result in a total foot print area of approximately 10,190 acres. The total foot print includes areas of impoundment, flat embankment, sloped embankment, and reclaimed areas. Infrastructure modifications and equipment relocations will be required during the proposed expansions.

Total plan view footprint of the current operations, including reclaimed areas, is approximately 8,900 acres consisting of the North and South sections. The proposed total plan view footprint of the Tailings site after expansion will be approximately 10,190 acres and will include the North, South, and new Northeast sections. The initial phase of construction will consist of the Northeast Expansion, relocation of infrastructure, and raise the North section.

Infrastructure additions and relocations associated with the northeast expansion will take place over a 2 to 3-year period. Initial tailings deposition in the Northeast expansion will begin within a few months of completion of infrastructure additions and associated relocations. Simultaneously, the current North section will be raised with embankments consisting of underflow tailings. The proposed expansion will include raising the existing North area and expanding onto an approximately 1,290-acre parcel adjacent to the Northeast corner (the Northeast expansion) of the existing impoundment for a combined active impoundment area of approximately 4,490 acres.

The final phase will consist of raising the North section and combining it with a portion of the South section.

Summary of Emission Totals:

The emissions listed below are an estimate of the total potential emissions from the source. Some rounding of emissions is possible.

Estimated Criteria Pollutant Potential Emissions		
CO_2 Equivalent	20.04	tons/yr
Carbon Monoxide	1.12	tons/yr
Nitrogen Oxides	0.28	tons/yr
Primary PM_{10}, Filterable Portion Only	83.05	tons/yr
Primary $PM_{2.5}$, Filterable Portion Only	12.58	tons/yr
Volatile Organic Compounds	0.04	tons/yr
Estimated Hazardous Air Pollutant Potential Emissions		
Generic HAPs (CAS #GHAPS)	176	lbs/yr
Total hazardous air pollutants	176	lbs/yr

Review of Best Available Control Technology:

1. BACT review regarding Tailings Impoundment

   Particulate emissions will be emitted from windblown dust at the Tailings site, and this section presents a BACT analysis for the emission source. The Tailings site can be categorized into four operational areas: impoundment, active flat embankment areas, inactive flat embankment areas and sloped embankment areas. These different areas are amenable to different control measures as a function of their operational characteristics.
   [Last updated October 17, 2013]

2. BACT review regarding Active Impoundment Area

   Step 1: Identify all control technologies
   The following control technologies have been identified for particulate control from emissions sources at a tailings site:
   a. Maintaining surface moisture: Maintaining surface moisture content conglomerates particles and reduces their likelihood to become airborne. Surface moisture content can be maintained by the application of water or continuous spigotting of saturated tailings slurry.
   b. Polymer application: As opposed to watering, chemical dust suppressants require less frequent reapplication. Polymers suppress emissions by changing the physical characteristics of the surface material. The polymers form a hardened surface that binds the particles together, thereby reducing their likelihood to become airborne.
   c. Revegetation: Revegetation assists with minimizing emissions. The vegetation holds the soil surface together and therefore makes it less prone to wind erosion.
   d. Enclosures: Enclosures reduce the wind shear at the surface and thereby reduce wind erosion and emissions.

   Step 2: Eliminate technically infeasible options
   a. Maintaining surface moisture - This control technology is technically feasible. The area is wetted with continuous spigotting of slurry tailings. Additionally, significant area of the active

impoundment is under water.
b. Polymer application - This control technology is not technically feasible in the area. The application of polymer minimizes dust created by wind erosion by creating a stabilized, sealed surface. It is not intended and is not effective for surfaces that will be covered by repeated application of saturated tailings, such as the active impoundment area.
c. Revegetation - Not technically feasible in an area of active tailings disposal. Re-vegetation is incompatible in an area of active tailings deposition. It would be impossible to sustain re-vegetation in an area of active tailings deposition.
d. Enclosure - The large size of the tailings impoundment makes the use of complete or partial enclosures unfeasible. Even if feasible, the costs of enclosing such a large area would be prohibitive.

Step 3: Rank Remaining Control Technologies by Control Effectiveness
Maintaining surface moisture is the only technically feasible control measure and, therefore, top ranked control for the active impoundment area at the tailings site.

Step 4: Evaluate Most Effective Controls and Document Results
Maintaining surface moisture is an effective and well utilized control method for the active impoundment area. For an active impoundment, this is accomplished by the reapplication of wet saturated tailings. Additionally, significant area of the active impoundment is under water.

Step 5: Select BACT
Maintaining surface moisture content through the application of wet saturated tailings is identified as BACT for the active impoundment area at the tailings site.
[Last updated November 5, 2013]

3. BACT review regarding Active Flat Embankment Area

Step 1: Identify all control technologies
The following control technologies have been identified for particulate control from emissions sources at a tailings site:
a. Maintaining surface moisture: Maintaining surface moisture content conglomerates particles and reduces their likelihood to become airborne. Surface moisture content can be maintained by the application of water or saturated underflow tailings.
b. Polymer application: As opposed to watering, chemical dust suppressants require less frequent reapplication. Polymers suppress emissions by changing the physical characteristics of the surface material. The polymers form a hardened surface that binds the particles together, thereby reducing their likelihood to become airborne.
c. Revegetation: Revegetation assists with minimizing emissions. The vegetation holds the soil surface together and therefore makes it less prone to wind erosion.
d. Enclosures: Enclosures reduce the wind shear at the surface and thereby reduce wind erosion and emissions.

Step 2: Eliminate technically infeasible options
a. Maintaining surface moisture - This control technology is technically feasible. The area is wetted with regular placement of saturated coarse underflow tailings. In a flat active embankment cell, the tailings are deposited at least every four days in the construction cells to raise the embankment areas. The tailings are wet and saturated when deposited. Areas typically remain moist for several days; however, there is some potential for potions of the embankment

to dry before reapplication of tailings to the area (which has been accounted for in emission estimates). Application of water for dust control in flat active embankment areas is not technically feasible as it tends to channelize directly to the drain point instead of spreading across the surface.

b. Polymer application - This control technology is not technically feasible in the area. The application of polymer minimizes dust created by wind erosion by creating a stabilized, sealed surface. It is not intended and is not effective for surfaces that will be covered by repeated application of tailings, such as the active flat embankment area.

c. Revegetation - Not technically feasible in an area of active tailings disposal. Re-vegetation is incompatible in an area of active tailings deposition. It would be impossible to sustain re-vegetation in an area of active tailings deposition.

d. Enclosure - The large size of the tailings impoundment makes the use of complete or partial enclosures unfeasible. Even if feasible, the costs of enclosing such a large area would be prohibitive.

Step 3: Rank Remaining Control Technologies by Control Effectiveness
Maintaining surface moisture is the only technically feasible and, therefore, top ranked control for the flat active embankment area at the tailings site.

Step 4: Evaluate Most Effective Controls and Document Results
Maintaining surface moisture is an effective and well utilized control method for the flat active embankment area. For an active impoundment, this is accomplished by the reapplication of wet saturated tailings.

Step 5: Select BACT
Maintaining surface moisture content through the application of wet saturated tailings is identified as BACT for the flat active embankment area at the tailings site.
[Last updated November 5, 2013]

4. BACT review regarding Inactive Flat Embankment Area

Step 1: Identify all control technologies
The following control technologies have been identified for particulate control from emissions sources at a tailings site:

a. Maintaining surface moisture: Maintaining surface moisture content conglomerates particles and reduces their likelihood to become airborne. Surface moisture content can be maintained by the application of water or saturated tailings.

b. Polymer application: As opposed to watering, chemical dust suppressants require less frequent reapplication. Polymers suppress emissions by changing the physical characteristics of the surface material. The polymers form a hardened surface that binds the particles together, thereby reducing their likelihood to become airborne.

c. Revegetation: Revegetation assists with minimizing emissions. The vegetation holds the soil surface together and therefore makes it less prone to wind erosion.

d. Enclosures: Enclosures reduce the wind shear at the surface and thereby reduce wind erosion and emissions.

Step 2: Eliminate technically infeasible options

a. Maintaining surface moisture - This control technology is technically feasible. In the inactive flat embankment areas, where tailings deposition has been completed, KUC installs sprinklers for watering. (Compaction in areas where tailings deposition has been completed

eliminates channelizing, an issue in active flat embankment areas.) In 2010 and 2011, KUC converted to an automated sprinkler system that wets the surface at regular intervals.

b. Polymer application - This control technology is technically feasible in the area. The application of polymer minimizes dust created by wind erosion by creating a stabilized, sealed surface. Polymers are applied to areas still waiting to be reclaimed.

c. Revegetation - This control technology is technically feasible for embankment areas released for reclamation, once KUC implements a revegetation plan for areas to be reclaimed.

d. Enclosure - The large size of the tailings impoundment makes the use of complete or partial enclosures unfeasible. Even if feasible, the costs of enclosing such a large area would be prohibitive.

Step 3: Rank Remaining Control Technologies by Control Effectiveness

Maintaining surface moisture with automated water sprinklers, polymer application to areas still waiting to be reclaimed and revegetation of reclaimed areas are all technically feasible for the inactive embankment areas. Because each of these control technologies has specific application during different times, it is neither necessary nor appropriate to rank relative control effectiveness. Areas are only reclaimed when the embankment areas have reached their desired heights and are final and no additional tailings deposition is anticipated.

Step 4: Evaluate Most Effective Controls and Document Results

Maintaining surface moisture is an effective and well utilized control method for the flat inactive embankment area. This is accomplished by the application of water with automated sprinkler system.

For areas released to be reclaimed, revegetation is effective in controlling emissions from the flat inactive embankment areas. Polymers are applied to areas still waiting to be reclaimed, which also control emissions from the area.

Step 5: Select BACT

Maintaining surface moisture with automated water sprinklers, polymer application to areas still waiting to be reclaimed and revegetation of areas are identified as BACT for the flat inactive embankment area at the tailings site.

[Last updated November 5, 2013]

5. BACT review regarding Sloped Embankment Area

Step 1: Identify all control technologies

The following control technologies have been identified for particulate control from emissions sources at a tailings site:

a. Maintaining surface moisture: Maintaining surface moisture content conglomerates particles and reduces their likelihood to become airborne. Surface moisture content can be maintained by the application of water or saturated tailings.

b. Polymer application: As opposed to watering, chemical dust suppressants require less frequent reapplication. Polymers suppress emissions by changing the physical characteristics of the surface material. The polymers form a hardened surface that binds the particles together, thereby reducing their likelihood to become airborne.

c. Revegetation: Revegetation assists with minimizing emissions. The vegetation holds the soil surface together and therefore makes it less prone to wind erosion.

d. Enclosures: Enclosures reduce the wind shear at the surface and thereby reduce wind erosion and emissions.

Step 2: Eliminate technically infeasible options

a. Maintaining surface moisture - This control technology is technically feasible. The area can be wetted with watering application.

b. Polymer application - This control technology is technically feasible in the area. The application of polymer minimizes dust created by wind erosion by creating a stabilized, sealed surface. Polymers are applied to areas until they are reclaimed and can be more effective than water sprays.

c. Revegetation - This control technology is technically feasible for embankment areas to be reclaimed. KUC implements a revegetation plan for areas to be reclaimed.

d. Enclosure - The large size of the tailings impoundment makes the use of complete or partial enclosures unfeasible. Even if feasible, the costs of enclosing such a large area would be prohibitive.

Step 3: Rank Remaining Control Technologies by Control Effectiveness

Polymers when applied per manufacturesâ€™ recommendations equal or exceed the control effectiveness associated with water sprays. Polymers therefore rank higher in control effectiveness than water sprays.

Revegetation is most effective in controlling emissions in the reclaimed areas.

Because each of these control technologies has specific application during different times, it is neither necessary nor appropriate to rank relative control effectiveness.

Step 4: Evaluate Most Effective Controls and Document Results

Polymer application is an effective and well utilized control method for the sloped embankment area.

Revegetation is effective in controlling emissions from the sloped reclaimed embankment areas.

Step 5: Select BACT

Polymer application and revegetation of reclaimed areas released are identified as BACT for the sloped embankment area at the tailings site.

[Last updated November 5, 2013]

Modeling Results:

A dispersion modeling analysis was performed for the following source:

Company: Kennecott

Site: Tailings Expansion

The individual HAP emission increases triggered the requirement to model under R307-410-5 for the following pollutants:

-Chromium

The model predicted all HAP concentrations to be less than their respective UDAQ - Toxic Screening Levels (TSL). Based on these results, no further analysis is required.

Pollutant	Average	Impact ug/cu.m	TSL ug/cu.m	Percent TSL
Chromium	24-Hour	0.0	0.1	5.9%

[Last updated July 17, 2013]

RECOMMENDED APPROVAL ORDER CONDITIONS

The intent is to issue an air quality Approval Order (AO) authorizing the project with the following recommended conditions and that failure to comply with any of the conditions may constitute a violation of the AO. The AO will be issued to and will apply to the following:

Name of Permittee:

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

Permitted Location:

Kennecott Utah Copper LLC: Power Plant/ Lab/ Tailings Impoundment
11984 West Highway 202
Magna, UT 84044

UTM coordinates: 405,000 m Easting, 4,513,000 m Northing, UTM Zone 12
SIC code: 1021 (Copper Ores)

Section I: GENERAL PROVISIONS

I.1 All definitions, terms, abbreviations, and references used in this AO conform to those used in the UAC R307 and 40 CFR. Unless noted otherwise, references cited in these AO conditions refer to those rules. [R307-101]

I.2 The limits set forth in this AO shall not be exceeded without prior approval. [R307-401]

I.3 Modifications to the equipment or processes approved by this AO that could affect the emissions covered by this AO must be reviewed and approved. [R307-401-1]

I.4 All records referenced in this AO or in other applicable rules, which are required to be kept by the owner/operator, shall be made available to the Director or Director's representative upon request, and the records shall include the two-year period prior to the date of the request. Unless otherwise specified in this AO or in other applicable state and federal rules, records shall be kept for a minimum of five (5) years. [R307-401-8]

I.5 At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this AO, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Director which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded. [R307-401-4]

I.6 The owner/operator shall comply with UAC R307-107. General Requirements: Breakdowns. [R307-107]

I.7 The owner/operator shall comply with UAC R307-150 Series. Inventories, Testing and Monitoring. [R307-150]

Section II: SPECIAL PROVISIONS

II.A The approved installations shall consist of the following equipment:

II.A.1 **Plantwide**

Tailings Site

II.A.2 **Emergency Generator**

Fuel Type	Liquid Petroleum (LP)
Maximum Rating	75 Brake Horsepower

II.B Requirements and Limitations

II.B.1 **Sitewide Conditions**

II.B.1.a The minimum cycle time required for wetting all interior beach areas of the Tailings Impoundment between February 15 and November 15 shall be at least every four days.

Monitoring:

KUC shall monitor the peripheral discharge pipe downtime (length of pipe, and duration) and the fugitive dust stabilization activities daily.

Recordkeeping:

Results of monitoring shall be maintained in accordance with Condition I.4 of this permit. [R307-401]

II.B.1.b Visible emissions caused by fugitive dust from the tailings site shall not exceed the following values:

A. 10% at the property boundary, and
B. 20% onsite except as defined in R307-309(3).

The fugitive dust control plan shall utilize the fugitive dust control strategies listed in UAC R307-309. Opacity observations of emissions from stationary sources shall be conducted according to R307-309-5(3). [R307-309]

Monitoring:

A visual opacity survey of the tailings impoundment, tailings embankment and tailings service roads shall be performed on a weekly basis by an individual trained on the observation procedures of 40 CFR 60, Appendix A, Method 9. The individual is not required to be a certified visible emissions observer (VEO). If visible emissions other than steam are observed

from an emission unit, an opacity determination of that emission unit shall be performed by a certified VEO in accordance with 40 CFR 60, Appendix A, Method 9 within 24 hours of the initial survey. If no visible emissions are observed for eight consecutive weeks, the observation frequency shall be reduced to a monthly basis. If visible emissions are observed during any monthly observation the frequency shall revert back to a weekly basis.

Minor natural gas combustion sources (<5 MMBtu/hr), cold solvent degreasers, organic liquid storage tanks (<19,812 gallons), cooling towers, and units equipped with a continuous opacity monitor are not affected emission units subject to this condition.

Recordkeeping:

A log of the visual opacity survey(s) shall be maintained in accordance with Condition I.4 of this permit. If an opacity determination is indicated, a notation of the determination will be made in the log. All data required by 40 CFR 60, Appendix A, Method 9 shall also be maintained in accordance with Condition I.4 of this permit. [R307-309]

II.B.1.c All unpaved access roads and other unpaved operational areas that are used by mobile equipment shall be water sprayed and/or chemically treated to control fugitive dust. Treatment shall be of sufficient frequency and quantity to maintain the surface material in a damp/moist or crusted condition. If chemical treatment other than magnesium chloride is to be used, the plan must be approved by the Director. Records of water and/or chemical treatment shall be kept for all periods when the plant is in operation. The records shall include the following items:

A. Date
B. Number of treatments made, dilution ratio, and quantity
C. Rainfall received, if any, and approximate amount
D. Time of day treatments were made

Records of treatment shall be made available to the Director upon request and shall include a period of two years ending with the date of the request. [R307-309]

II.B.1.d Between February 15 and November 15 of each calendar year, KUC shall inspect the interior surface area, unpaved roads, and exterior dike area at least once every two weeks and daily when 48 hours before a wind event, when wind gusts are forecasted to exceed 25 mph for more than one hour by the Tailings site forecast. Wind events may be measured by KUC's station at the Tailings site or the Salt Lake International airport. [R307-309]

II.B.1.e The tailings distribution system shall be operated to maximize surface wetness. Wind erosion potential is the area that is not wet, frozen, vegetated, crusted or treated and has the potential for wind erosion. No more than 50 contiguous acres or more than 5% of the total tailings area shall be permitted to have the potential for wind erosion. If it is determined that the area with the potential for wind erosion is more than 50 contiguous acres or greater than 5% of the total surface area, or at the request of the Director, inspections shall be conducted once every five working days. KUC shall immediately initiate the revised inspection schedule and the results reported to the Director within 24 hours of the inspection. The schedule shall continue to be

implemented until KUC measures a total surface area with the potential for wind erosion is less than or equal to 5% of the total surface area and less than 50 contiguous acres. If KUC or the Director determines that the percentage of wind erosion potential is exceeded, KUC shall meet with the Director, or Director's staff, to discuss additional or modified fugitive dust controls/operational practices, and an implementation schedule for such, within five working days following verbal notification by either party.

Inactive but non-reclaimed areas are to be stabilized by chemical stabilizing agents, ponded water, sprinklers, vegetation or other methods of fugitive dust control. Ponded water is the inactive non reclaimed areas on the impoundment where water collects (ponds) resulting in standing water and/or damp, moist, or saturated ground conditions that prevent planting equipment access and/or the establishment of stable vegetation growth.

Monitoring:

KUC shall conduct wind erosion potential inspections monthly between February 15 and November 15 for the Impoundment areas. Observations shall be taken from the Tailings embankment at a height sufficient enough to be able to visually assess the surface of the tailings interior Impoundment surface and exterior embankment surface.

If it is determined by KUC or the Director that the percentage of wind erosion potential is greater than 5 percent, or at the request of the Director, an inspection schedule shall be immediately initiated by KUC that will result in inspections being conducted once every five working days and results reported to the Director within 24 hours of the determination, until KUC measures a total surface with the potential for wind erosion, less than or equal to 5 percent.

Between February 15 and November 15 of each calendar year, KUC shall alert the DAQ promptly, continue surveillance and coordination if a wind event is forecasted within 48 hours and water spray unreclaimed dikes.

Recordkeeping:

Results of monitoring shall be maintained in accordance with Condition I.4 of this permit. [R307-309]

II.B.1.f KUC shall control the fugitive dust on all areas that have been closed for future tailings discharge and/or shutdown

A. The fugitive dust shall be controlled by reclaiming, revegetation, and/or by another plan that has been approved by the Director.

B. If a temporary or permanent shutdown occurs that would affect any area of the KUC Tailings site, KUC shall follow the dust control procedures in Condition II.B.1.f.A for all areas of the Tailings site and shall submit a final dust control plan for all areas of the Tailings site and have it approved at least 60 days prior to the shutdown.

All fugitive dust control plans for the Tailings site shall be submitted to the Director, attention Major New Source Review Section, and Compliance Section, for approval. [R307-309]

Monitoring:

The dust control plan required for this permit condition will serve as monitoring.

Recordkeeping:

The dust control plan required for this permit condition will serve as recordkeeping. [R307-309]

II.B.1.g Exterior tailings site areas that are determined by KUC or the Director to be sources of excessive fugitive dust, shall be stabilized through vegetation cover or other approved methods. The exterior tailings surface area shall be re-vegetated or stabilized so that no more than 50 contiguous acres and 5% of the total surface area shall be subject to wind erosion. [R307-309]

Monitoring:

Between February 15 and November 15 of each calendar year, KUC shall inspect the exterior dike area at least once every two weeks. The frequency shall be increased to daily at least 48 hours prior to each wind event that is forecasted. A wind event is defined as: wind gusts exceeding 25 mph for more than one hour, as measured by KUC's weather monitoring station on top of the tailings site or alternately at the Salt Lake International airport.

Recordkeeping:

All inspections, vegetation, and other stabilization activities shall be documented in accordance with Condition I.4 of this permit. [R307-309]

II.B.1.h As the embankment cells are filled during continual raising of the embankment, dust shall be controlled by the inherent high water content of the hydraulically placed cyclone underflow. Portions of the embankment that are not under active construction shall be kept wet or tackified by applying chemical stabilizing agents or water pumped from the toe ditch. Newly formed exterior slopes shall be stabilized with tackifiers or vegetation.

Monitoring:

KUC shall monitor the fugitive dust stabilization activities daily.

Recordkeeping:

Results of monitoring shall be maintained in accordance with Condition I.4 of this permit. [R307-309]

II.B.1.i Disturbed or stripped areas of the Tailings site shall be kept sufficiently moist during the project to minimize fugitive dust. This control, or other equivalent control methods, shall remain operational during the project cycle and until the areas have been reclaimed. The control methods used shall be operational as needed 24 hours per day, 365 days per year or until the area has been reclaimed. [R307-309]

Monitoring:

Records required for this permit condition will serve as monitoring.

Recordkeeping:

The control method used and the date shall be recorded for all periods. Results of monitoring shall be maintained in accordance with Condition I.4 of this permit. [R307-309]

II.B.1.j On a quarterly basis, KUC shall summarize the following fugitive dust abatement program activities for the Director:

A. Documentation of the wind direction and speed data for days that winds exceeded 25 mph for a period greater than one hour during which no preceding or concurrent precipitation occurred.

B. Documentation of the inspections of the tailings surface area, including the wind erosion potential of the tailings surface area.

C. Documentation showing areas of dust suppressant application and planting during the quarter.

D. Quarterly reports shall be submitted to the Director within 30 days following the end of each calendar quarter.

Monitoring:

Records required for this permit condition will serve as monitoring.

Recordkeeping:

Results of monitoring shall be maintained in accordance with Condition I.4 of this permit. [R307-309]

II.B.1.k Construction of the Tailings embankment shall be with coarse tailings (less than 25% of material passing #200 sieve).

Monitoring:

Records required for this permit condition will serve as monitoring.

Recordkeeping:

The control method used and the date shall be recorded for all periods. Results shall be maintained in accordance with Condition I.4 of this permit. [R307-401-8]

II.B.1.l All areas that are inactive but non-reclaimed are to be stabilized by chemical stabilizing agents, ponded water, sprinklers, vegetation or other methods of fugitive dust control. Those areas shall be kept wet or tackified by applying chemical stabilizing agents or water as necessary.

Monitoring:

Between February 15 and November 15 of each calendar year, KUC shall inspect the Tailings Impoundments areas at least once every two weeks. The frequency shall be increased to daily at least 48 hours prior to each wind event that is forecasted.

Recordkeeping:

Records of treatments shall be kept for all periods including the following items: date, number of treatments made, dilution rate, and quantity, and the time of day treatments were made. In addition, records of days of freezing temperature shall be kept. [R307-309]

Section III: APPLICABLE FEDERAL REQUIREMENTS

In addition to the requirements of this AO, all applicable provisions of the following federal programs have been found to apply to this installation. This AO in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including UAC R307.

Title V (Part 70) major source

REVIEWER COMMENTS

The AO will be based on the following documents:

Incorporates	Additional Information dated October 31, 2013
Incorporates	Additional Information dated September 16, 2013
Incorporates	Additional Information dated August 15, 2013
Incorporates	Additional Information dated August 5, 2013
Incorporates	Additional Information dated July 1, 2013
Incorporates	Additional Information dated June 19, 2013
Incorporates	Additional Information dated February 7, 2013
Incorporates	Additional Information dated September 17, 2012
Incorporates	Additional Information dated August 9, 2012
Incorporates	Additional Information dated May 21, 2012
Incorporates	Additional Information dated December 28, 2011
Is Derived From	Notice of Intent dated December 19, 2011
Supersedes	DAQE-AN0572018-06 dated April 6, 2006

1. Comment regarding Tailings Impoundment Expansion:
   The control of fugitive emissions was compared with the requirements for the ASARCO LLC tailing impoundment, and the Freeport-McMoran Sierrita, Inc. tailing impoundments located in Arizona. The results showed that the KUC impoundment was controlled at a higher level than these sites. [Last updated February 12, 2014]

2. Comment regarding Emission Calculations for Impoundment Area:
   Emissions were not calculated in accordance with AP-42 Sections 13.2.5, Industrial Wind Erosion. These factors were developed for windblown dust from aggregate storage piles. The emission factors were developed for nonhomogeneous surfaces impregnated with nonerodible elements. The tailings are uniform in size distribution and are not impregnated with nonerodible elements. Based on advice sought from the EPA Office of Air Quality Planning and Standards (OAQPS), the algorithms used in Chapter 13.2.5 (EPA, 2006) are not representative of the operations at the Tailings Impoundment facility. However, if KUC were to estimate emissions using this algorithm, windblown dust from the Tailings Impoundment facility would be zero.

   KUC is proposing to use modified AP-42 emission factors approved by the DAQ as a more conservative (higher) estimate of emissions compared to AP-42 Chapter 13.2.5. These factors were developed specifically for the Tailings Impoundment facility when it was expanded in 1995.The AP-42 emission factors are used for cone shaped piles and they were modified to incorporate the shape of the tailings impoundment. [Last updated February 12, 2014]

3. Comment regarding Fugitive Emissions:
   The applicable conditions that are listed in the PM_{10} SIP that was approved by EPA in 1994, have been included as AO conditions. Some of the significant requirements that were included are:
   - The Tailings distribution system being operated to maximize surface wetness
   - Conducting inspections of the tailings area between February 15 and November 15 of each year,
   - Requiring that no more than 50 contiguous acres or more than 5% of the total tailings area shall be permitted to have the potential for wind erosion,
   - Minimizing fugitive dust emissions by applying magnesium chloride or other stabilization

methods approved by the Director,
- Controlling fugitive dust from unpaved roads and other unpaved operational areas,
- Requirements that pertain to wind events being forecasted 48 hours in advance.
These requirements and additional requirements from the SIP have been included in the permit conditions for the tailings site.
[Last updated February 12, 2014]

4. Comment regarding Nonattainment Area:
The Tailings site is located in a non-attainment area for PM_{10} and $PM_{2.5}$. UAC R307 does not require ambient air quality modeling for pollutants that are in non-attainment areas, but modeling is required for pollutants that are in attainment in the non-attainment area and that exceed specified threshold levels. Therefore, this project does not require modeling for criteria pollutants. (Offsets for PM_{10} are required in accordance with R307-403-5). [Last updated February 12, 2014]

5. Comment regarding Aggregation of Sites
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Aggregation was considered for the tailings impoundment and the Bonneville Borrow Plant. In consultation with EPA during the development of the 1994 PM_{10} SIP, DAQ divided the operations at Kennecott into three main sources. The Smelter and Refinery each have a separate AO but are combined into the same Title V permit with the ID # of 10346. The Bingham Canyon Mine and Copperton Concentrator have been designated as minor sources with each having a separate AO, but they have the same source ID# 10571.

The Magna Concentrator, Power Plant, Tailings Impoundment and Laboratory have been combined into one Title V permit, but each site has a separate AO. The source ID# for these operations is 10572. The Magna Concentrator was a major source and had a separate AO but is no longer in existence. The Power Plant was considered a support facility to the concentrator and it had a separate AO from the concentrator. The power plant is a major source which invokes the requirement for the Title V Permit. The tailings impoundment is a minor source which is also part of this source grouping. The Bonneville Borrow Area is a minor source, and is also a support facility to the tailings impoundment.

UAC R307-101-2 defines what a source is and one of the requirements is pollutant emitting activities which belong to the same industrial grouping (SIC codes). The BBP is grouped with the Laboratory, Power Plant and Tailings Impoundment for Title V purposes but have different SIC codes. To be considered in the same SIC group, a source has to have the same first two digits of the SIC codes. The SIC code is 1442 (Construction Sand and Gravel) for the BBP, 4911 (Electric Services) for the Power Plant, 1021 (Copper Ores) for the Tailings Impoundment, and 8734 (Testing Laboratories) for the KUC Laboratory. The BBP does not have the same first two digits of any of the other sources grouped together under the Title V program.

Since the borrow area is a support facility for the tailings impoundment, and the modification of both sources is concurrent, the emissions from both the borrow area and the impoundment will be reviewed together and the appropriate permitting mechanism will be applied to this action and during review of the tailings impoundment NOI. All emission increases have been addressed and evaluated in the Engineering Review and appropriate requirements established in the ITA. The DAQ has thus addressed the

emission increases in accordance with current DAQ policies and Federal and State Regulations.

Therefore, they are a separate source and are required to obtain a separate AO. [Last updated February 12, 2014]

ACRONYMS

The following lists commonly used acronyms and associated translations as they apply to this document:

40 CFR	Title 40 of the Code of Federal Regulations
AO	Approval Order
BACT	Best Available Control Technology
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CDS	Classification Data System (used by EPA to classify sources by size/type)
CEM	Continuous emissions monitor
CEMS	Continuous emissions monitoring system
CFR	Code of Federal Regulations
CMS	Continuous monitoring system
CO	Carbon monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent - 40 CFR Part 98, Subpart A, Table A-1
COM	Continuous opacity monitor
DAQ	Division of Air Quality (typically interchangeable with UDAQ)
DAQE	This is a document tracking code for internal UDAQ use
EPA	Environmental Protection Agency
FDCP	Fugitive dust control plan
GHG	Greenhouse Gas(es) - 40 CFR 52.21 (b)(49)(i)
GWP	Global Warming Potential - 40 CFR Part 86.1818-12(a)
HAP or HAPs	Hazardous air pollutant(s)
ITA	Intent to Approve
LB/HR	Pounds per hour
MACT	Maximum Achievable Control Technology
MMBTU	Million British Thermal Units
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOI	Notice of Intent
NO_x	Oxides of nitrogen
NSPS	New Source Performance Standard
NSR	New Source Review
PM_{10}	Particulate matter less than 10 microns in size
$PM_{2.5}$	Particulate matter less than 2.5 microns in size
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
R307	Rules Series 307
R307-401	Rules Series 307 - Section 401
SO_2	Sulfur dioxide
Title IV	Title IV of the Clean Air Act
Title V	Title V of the Clean Air Act
TPY	Tons per year
UAC	Utah Administrative Code
UDAQ	Utah Division of Air Quality (typically interchangeable with DAQ)
VOC	Volatile organic compounds