State of Utah

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Department of
Environmental Quality

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DIVISION OF AIR QUALITY
Bryce C. Bird
Director

RN105710048

June 3, 2024

Brendan Murphy
Rio Tinto Kennecott Utah Copper LLC
4700 Daybreak Parkway
South Jordan, UT 84095

Dear Brendan Murphy,

Re: Engineer Review:
Modification to Approval Order to DAQE-AN105710047-21, to Add Paste Plant and Support Equipment
Project Number: N105710048

The DAQ requests a company representative review and sign the attached Engineer Review (ER). This ER identifies all applicable elements of the New Source Review permitting program. Rio Tinto Kennecott Utah Copper LLC should complete this review within **10 business days** of receipt.

Rio Tinto Kennecott Utah Copper LLC should contact **Tad Anderson** at (385) 306-6515 if there are questions or concerns with the review of the draft permit conditions. Upon resolution of your concerns, please email **Tad Anderson** at **tdanderson@utah.gov** the signed cover letter. Upon receipt of the signed cover letter, the DAQ will prepare an ITA for a 30-day public comment period. At the completion of the comment period, the DAQ will address any comments and will prepare an Approval Order (AO) for signature by the DAQ Director.

If Rio Tinto Kennecott Utah Copper LLC does not respond to this letter within **10 business days,** the project will move forward without source concurrence. If Rio Tinto Kennecott Utah Copper LLC has concerns that cannot be resolved and the project becomes stagnant, the DAQ Director may issue an Order prohibiting construction.

Approval Signature _____
(Signature & Date)

UTAH DIVISION OF AIR QUALITY
ENGINEER REVIEW

SOURCE INFORMATION

Project Number	N105710048
Owner Name	Rio Tinto Kennecott Utah Copper LLC
Mailing Address	4700 Daybreak Parkway South Jordan, UT, 84095
Source Name	Rio Tinto Kennecott Utah Copper LLC- Mine & Copperton Concentrator
Source Location	8362 W 10200 S Bingham Canyon, UT 84006
UTM Projection	407,000 m Easting, 4,493,000 m Northing
UTM Datum	NAD27
UTM Zone	UTM Zone 12
SIC Code	1021 (Copper Ores)
Source Contact	Jenny Esker
Phone Number	(801) 569-6494
Email	jenny.esker@riotinto.com
Billing Contact	Jenny Esker
Phone Number	(801) 569-6494
Email	jenny.esker@riotinto.com
Project Engineer	Tad Anderson, Engineer
Phone Number	(385) 306-6515
Email	tdanderson@utah.gov
Notice of Intent (NOI) Submitted	February 9, 2024
Date of Accepted Application	April 5, 2024

SOURCE DESCRIPTION

General Description
Rio Tinto Kennecott Utah Copper LLC (RTK) owns and operates the Bingham Canyon Mine (BCM) and the Copperton Concentrator. The BCM is an open pit mining operation located in the southwest corner of Salt Lake County, Utah. Ore from the mine is conveyed to the Copperton Concentrator located approximately five miles north of the open pit in Copperton, Utah where it is ground and treated to produce copper concentrate.

NSR Classification:
Minor Modification

Source Classification
Located in, Northern Wasatch Front O3 NAA, Salt Lake City UT $PM_{2.5}$ NAA, Salt Lake County
SO_2 NAA, Salt Lake County
Airs Source Size: B

Applicable Federal Standards
NSPS (Part 60), A: General Provisions
NSPS (Part 60), LL: Standards of Performance for Metallic Mineral Processing Plants
NSPS (Part 60), OOO: Standards of Performance for Nonmetallic Mineral Processing Plants
NSPS (Part 60), IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
NSPS (Part 60), JJJJ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines
MACT (Part 63), A: General Provisions
MACT (Part 63), ZZZZ: National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines
Title V (Part 70) Area Source

Project Proposal
Modification to Approval Order to DAQE-AN105710047-21, to Add Paste Plant and Support Equipment

Project Description
RTK is requesting a modification of BCM Approval Order (AO) DAQE-AN105710047-21 to install and operate facilities associated with underground mining operations. The underground mining operations include the use of a new Paste Plant with two storage silos, a mixer dust collector and four emergency standby generators for the employee ventilation systems.

The new storage silos, at the bottom of the mine, support the Paste Plant operations where RTK will make usable concrete from lime and other materials. The mixer dust collector captures emissions from the paste plant mixer process area, where lime and other materials are blended together to make useable concrete.

Process Description
The ore and waste rock at the BCM are transferred from the mining areas to other areas of the mine through a series of transfers using haul trucks and conveyor belts. Ore is transferred to the in-pit crusher with haul trucks from the shovel face and waste rock is hauled to dumping areas

with haul trucks. After the ore is crushed, it is conveyed to the Copperton Concentrator. Once the ore is processed at the concentrator, it is transferred to the smelter.

EMISSION IMPACT ANALYSIS

Modeling was submitted for PM_{10} and NO_2. A modeling memo was generated containing the summary DAQE-MN105710048-24 with recommended conditions for testing times and testing quantity. [Last updated April 25, 2024]

SUMMARY OF EMISSIONS

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

Criteria Pollutant	Change (TPY)	Total (TPY)
CO_2 Equivalent	718.29	9038.47
Carbon Monoxide	4.34	1712.04
Nitrogen Oxides	0.60	5842.71
Particulate Matter - PM_{10}	0.41	1519.62
Particulate Matter - PM_{10} (Fugitives)	0.00	1509.76
Particulate Matter - $PM_{2.5}$	0.23	369.44
Particulate Matter - $PM_{2.5}$ (Fugitives)	0.00	367.76
Sulfur Dioxide	0.01	7.44
Volatile Organic Compounds	0.19	314.32

Hazardous Air Pollutant	Change (lbs/yr)	Total (lbs/yr)
Total HAPs (CAS #THAPS)	100	3580
	Change (TPY)	**Total (TPY)**
Total HAPs	0.05	1.79

Note: Change in emissions indicates the difference between previous AO and proposed modification.

Review of BACT for New/Modified Emission Units

1. **BACT review regarding Equipment**

BACT has been conducted for the two storage silos, a mixer dust collector and four emergency standby generators. The following is a summary of the results.

Storage Silos
BACT was conducted for the storage silos by reviewing the RBLC. The RBLC and CARB databases identify vent filters/baghouses and enclosures as possible control technologies for limiting emissions from storage silos. Baghouses are more effective than enclosures in minimizing emissions from storage silos. BACT for the storage silos is the use of baghouses and a 10 % opacity limit.

Mixer Dust Collector/Baghouse
BACT was conducted for the mixer dust collector by reviewing the RBLC. The RBLC and CARB databases identify vent filters/baghouses and enclosures as possible control technologies for limiting emissions from mixer dust collectors. Baghouses are more effective than enclosures in minimizing emissions from mixer dust collectors. BACT for the mixer dust collector is the use of baghouses and a 10 % opacity limit.

Emergency Generators
BACT was conducted for the emergency generator engine by reviewing the RBLC. The following technologies were specified in the analysis: good combustion practices, maintenance and operating practices, use of low-sulfur diesel fuel, compliance with applicable NSPS IIII requirements, compliance with applicable NESHAP ZZZZ requirements and the use of SCR. All of the listed control technologies are technically feasible, except for SCR. For SCR systems to function effectively, exhaust temperatures must be 200 degree C to 500 degree C to enable catalyst activation. SCR control efficiencies are low during the first 20 to 30 minutes after engines start up during maintenance and testing. There are also complications controlling the excess ammonia during the engine startup during maintenance and testing from SCR use. SCR is not considered technically feasible for emergency units.

BACT for diesel-fired emergency engines, is the following:

Good combustion, maintenance, and operating practices
Use of low-sulfur diesel fuel
Compliance with applicable NSPS IIII requirements
Use of a tier certified engine
Limit on hours of operation for maintenance and testing operations
~~Compliance with applicable NESHAP ZZZZ requirements is not required~~
[Last updated May 31, 2024]

SECTION I: GENERAL PROVISIONS

The intent is to issue an air quality 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. **(New or Modified conditions are indicated as "New" in the Outline Label):**

I.1	The limits set forth in this AO shall not be exceeded without prior approval. [R307-401]
I.2	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.3	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 two (2) years. [R307-401-8]
I.4	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.5	The owner/operator shall comply with R307-150 Series. Inventories, Testing and Monitoring. [R307-150]
I.6	The owner/operator shall comply with UAC R307-107. General Requirements: Breakdowns. [R307-107]
I.7	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.8	The owner/operator shall submit documentation of the status of construction or modification to the Director within 18 months from the date of this AO. This AO may become invalid if construction is not commenced within 18 months from the date of this AO or if construction is discontinued for 18 months or more. To ensure proper credit when notifying the Director, send the documentation to the Director, attn.: NSR Section. [R307-401-18]

SECTION II: PERMITTED EQUIPMENT

The intent is to issue an air quality 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. **(New or Modified conditions are indicated as "New" in the Outline Label):**

II.A THE APPROVED EQUIPMENT

II.A.1	**KUC Bingham Mine** KUC operates the BCM. KUC removes ore from the BCM by drilling, blasting, crushing and hauling.

II.A.2	**Main In-pit Crusher** Main in-pit crusher Main in-pit crusher baghouse
II.A.3	**Portable Roadbase Crushers** Two portable crushing and screening plants used to crush material for road base Maximum crusher unit capacity 700 tons per hour, each
II.A.4	**Conveyors** Conveyors and two transfer points with baghouses (Baghouses C6/C7 and Baghouses C7/C8)
II.A.5	**Lime Silos** Lime silos with fabric type bin vent control units
II.A.6	**Sample Preparation Equipment** Sample preparation equipment with baghouse
II.A.7	**SX/EW plant** SX/EW plant with electrowinning acid mist eliminator
II.A.8	**Degreasers** Various degreasing parts washers
II.A.9	**Gasoline Fueling Stations**
II.A.10	**LPG-Fired Emergency Generators** Nine Liquefied Petroleum gas-fired emergency generators Site — Maximum Rating Lark Gate #1 — 107 Brake Horsepower (BHP) #2 — 49 BHP Production Control Building 6690 — 150 BHP Communications 6190 — 75 BHP Mandy's Landing — 75 BHP East Side Dump — 49 BHP Zelnora — 49 BHP SAM Site — 49 BHP Substation 2 — 49 BHP
II.A.11	**Diesel-Fired Emergency Generators** Nine diesel-fired emergency generators (4 NEW) 1) Support Generators 1-5 1. Maximum rating 2,250 kW 2. Maximum rating 700 kW 3. Maximum rating 700 kW 4. Maximum rating 500 kW 5. Maximum rating 2,000 kW 2) Ventilation System Generators 6-9 (NEW)

	6. Maximum rating 2,000 kW 7. Maximum rating 2,000 kW 8. Maximum rating 2,000 kW 9. Maximum rating 3,250 kW
II.A.12	**Concrete Batch Plant** 1) One 25 cubic yard per hour batch plant controlled by a baghouse 2) One cement storage silo controlled by a baghouses 3) Conveyors and cement trucks 4) Storage silos with fabric filters
II.A.13	**Crushers and Screens** Portable crushing and screening plants with associated conveyors used to crush ore and waste rock. Conveyors partially enclosed transfer points or water sprays
II.A.14	**Underground Mining Support Equipment** 1) One (1) 150 cubic yard per hour batch plant controlled by baghouse a) One (1) cement storage silo with a baghouse b) Conveyors and cement trucks c) Storage silos with fabric filters 2) One (1) natural gas-fired boiler - 2.0 MMBTU/hr 3) One (1) natural gas-fired boiler - 4.0 MMBTU/hr 4) Three (3) diesel-fired heaters - 4.2 MMBTU/hr (each) 5) One (1) diesel-fired generator - 71 kW
II.A.15 NEW	**Paste Plant (NEW)** 1. Two (2) Storage silos with baghouse 2. One (1) Mixer Dust Collector with baghouse

SECTION II: SPECIAL PROVISIONS

The intent is to issue an air quality 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. **(New or Modified conditions are indicated as "New" in the Outline Label):**

II.B REQUIREMENTS AND LIMITATIONS

II.B.1	**Limitations and Test Procedures**
II.B.1.a NEW	Emissions at all times from the indicated emission points after primary control shall not exceed the following rates and concentrations: A. Main In-Pit Crusher Baghouse Vent Pollutant lb/hr grains per dry standard cubic foot (dscf) (68 F, 29.92 in Hg)

	PM_{10} 1.77 0.016 $PM_{2.5}$ 0.78 0.007 B. Controlled Drop Point Baghouse Vent (C6/C7, located outside of the pit) Pollutant lb/hr grains per dry standard cubic foot (dscf) (68 F, 29.92 in Hg) PM_{10} 0.31 0.007 C. Controlled Drop Point Baghouse Vent (C7/C8, located outside of the pit) Pollutant lb/hr grains per dry standard cubic foot (dscf) (68 F, 29.92 in Hg) PM_{10} 0.19 0.007. [R307-401-8]
II.B.1.b NEW	Stack testing to show compliance with the emission limitations stated in the above condition shall be performed as specified below: A. Emissions Point — Pollutant — Testing Status — Test Frequency Main In-Pit Crusher Baghouse Vent — PM_{10} — * — # $PM_{2.5}$ — * — # Controlled Drop Point Baghouse Vent (C6/C7, located outside of the pit) — PM_{10} — * — # Controlled Drop Point Baghouse Vent (C7/C8, located outside of the pit) — PM_{10} — * — # B. Testing Status * The initial testing has already been performed. # Test every three years. If a unit is not in operation when a test is due, the owner/operator may request an extension for the test. C. Notification The Director shall be notified at least 30 days prior to conducting any required emission testing. A source test protocol shall be submitted with the testing notification is submitted to the Director. The source test protocol shall be approved by the Director prior to performing the test(s). The source test protocol shall outline the proposed test methodologies, and stack to be tested. A pretest conference shall be held, if directed by the Director. D. Sample Location

	The emission point shall be designed to conform to the requirements of 40 CFR60, Appendix A, Method 1, or other EPA approved methods acceptable to the Director. An Occupational Safety and Health Administration (OSHA) or Mine Safety and Health Administration (MSHA) approved access shall be provided to the test location. E. Volumetric Flow Rate 40 CFR 60, Appendix A, Method 2 or other EPA approved testing methods acceptable to the Director. F. $PM_{10}/PM_{2.5}$ For stacks in which no liquid drops are present, the following methods shall be used: 40 CFR 51, Appendix M, Methods 201 or 201a or other EPA-approved testing method acceptable to the Director. The back half condensable particulate emissions shall also be tested (where applicable) using 40 CFR 51, Appendix M Method 202, or other EPA-approved testing method acceptable to the Director. All particulate captured using Method 202 shall be considered $PM_{2.5}$ and/or PM_{10}. For stacks in which liquid drops are present, methods to eliminate the liquid drops shall be explored. If no reasonable method to eliminate the drops exists, then the following methods shall be used: 40 CFR 60, Appendix A, Method 5, 5a, 5d, 5i or other as appropriate. If using Method 5 or any variation of Method 5, a scanning electron microscopy analysis or other equivalent method shall be used to determine the fraction of PM_{10} and/or $PM_{2.5}$, as approved by the Director. The back half condensable particulate emissions shall also be tested using 40 CFR 51, Appendix M Method 202 or other EPA-approved testing method acceptable to the Director. All particulate captured using Method 202 shall be considered $PM_{2.5}$ and/or PM_{10}. For filterable emission limits, condensable emissions shall not be used for compliance demonstrations. For filterable + condensable emission limits, both filterable and condensable emissions shall be used for compliance demonstrations. [R307-401-8]
II.B.1.c	G. Calculations To determine mass emission rates (lb/hr, etc.) the pollutant concentration as determined by the appropriate methods above shall be multiplied by the volumetric flow rate and any necessary conversion factors determined by the Director, to give the results in the specified units of the emission limitation. H. Source Operation For a new source/emission point, the production rate during all compliance testing shall be no less than 90% of the production capacity of the equipment. If the maximum production capacity has not been achieved at the time of the test, the following procedure shall be followed: 1) Testing shall be at no less than 90% of the production rate achieved to date. 2) If the test is passed, the new maximum allowable production rate shall be 110% of the tested achieved rate. This new allowable maximum production rate shall remain in effect until successfully tested at a higher rate. This

	process may be repeated until the maximum AO production rate is achieved. For an existing source/emission point, the production rate during all compliance testing shall be no less than 90% of the maximum production achieved in the previous three years. [R307-401-8]
II.B.1.d NEW	Visible emissions from the following emission points shall not exceed the following values: A. Main In-Pit crusher baghouse vent — 7% opacity B. Controlled drop point baghouse vent (C6/C7, located outside of the pit) — 7% opacity C. Controlled drop point baghouse vent (C7/C8, located outside of the pit) — 7% opacity D. Concrete batch plant baghouse — 10% opacity E. All other conveyor transfer points — 10% opacity F. Lime silos — 10% opacity G. Sample preparation equipment with baghouse — 10% opacity H. Drilling — 10% opacity I. LP gas-fired emergency generators — 10% opacity J. Nonmetallic Mineral Processing Screens and Conveyors — 7% opacity K. Nonmetallic Mineral Processing Crushers — 12% opacity L. Metallic Mineral Processing Equipment — 10% opacity M. Electrowinning Plant with electrowinning acid mist eliminator — 15% opacity N. All other points except as defined in other conditions of this AO — 10% opacity O. Diesel-fired Equipment — 20% opacity Opacity observations of emissions from stationary sources shall be conducted according to 40 CFR 60, Appendix A, Method 9. [R307-201]

II.B.1.e	For sources that are subject to NSPS, opacity shall be determined in accordance with 40 CFR 60.11(b) and 40 CFR 60, Appendix A, Method 9. It is the responsibility of the owner/operator of the source to supply these observations to the Director. A current certified observer must be used for these observations. Emission points that are subject to the initial observations are: A. All crushers B. All screens C. All conveyor transfer points. [40 CFR 60 Subpart A]
II.B.1.f	The following limits shall not be exceeded: A. Total material moved (ore and waste) shall not exceed 260,000,000 tons per rolling 12-month period*. B. Annual emissions of SO_2 shall not exceed 7 tons per rolling 12-month period. C. Maximum total mileage per calendar day for diesel-powered ore and waste haul trucks shall not exceed 30,000 miles. D. Minimum design payload per ore and waste haul truck shall not be less than 240 tons. Minimum design payload for trucks hauling material to develop new mining technologies, and material from maintenance activities shall not be less than 40 tons. Trucks used for underground development and operation may be smaller depending on application. E. Maximum number of wheels per ore or waste haul truck shall not exceed six wheels. F. Height of mine waste dump lift shall not exceed 1000 feet. G. The surface area of the Solvent Extraction/Electrowinning Plant mixer/settlers shall not exceed 1,100 ft^2. *Total ore and waste limitation shall be applied to dry tons of new material mined at the production shovels face. The owner/operator shall determine compliance with the 12-month period limits on a rolling 12-month total. The owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. The owner/operator shall keep records of daily total mileage for all periods when the mine is in operation. The owner/operator shall track haul truck miles with a Global Positioning System or equivalent. The system shall use real time tracking to determine daily mileage. SO_2 emissions from fuel burning shall be determined using the following formula: SO_2 tpy = (gal fuel/year)*(7.05 lb/gal)*(%S by wt.)/2000 lb/ton*(2 lb SO_2/lb S). [R307-401-8]

II.B.1.g	The following site-wide emission limits at the BCM shall not be exceeded: A. 7,350 tons of NO_x, PM_{10} and SO_2 combined per rolling 12-month period. B. 6,205 tons of NO_x, $PM_{2.5}$ and SO_2 combined per rolling 12-month period. The owner/operator shall determine compliance with the 12-month period limits on a rolling 12-month total per methodology outlined in Appendix A. The owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. [R307-401-8]
II.B.2	**Equipment Requirements**
II.B.2.a	The Main In-Pit Crusher Baghouse shall control process streams from the Main In-Pit Crusher. This baghouse shall be sized to handle at least 12,898 Dry Standard Cubic Feet per Minute (DSCFM). All exhaust air from the Main In-Pit Crusher shall be routed through the baghouse before being vented to the atmosphere. [R307-401-8]
II.B.2.b	The lime silos fabric bin vent control units shall control process streams from the lime silos. This control unit shall be sized to handle at least 616 DSCFM. All exhaust air from the lime silos shall be routed through the control unit before being vented to the atmosphere. [R307-401-8]
II.B.2.c	The Controlled Transfer Drop Point C6/C7 baghouse shall control process streams from the drop point. This baghouse shall be sized to handle at least 5,120 DSCFM. All exhaust air from the C6/C7 transfer drop point shall be routed through the baghouse before being vented to the atmosphere. [R307-401-8]
II.B.2.d	The Controlled Transfer Drop Point C7/C8 baghouse shall control process streams from the drop point. This baghouse shall be sized to handle at least 3,168 DSCFM. All exhaust air from the C7/C8 transfer drop point shall be routed through the baghouse before being vented to the atmosphere. [R307-401-8]
II.B.2.e	The Sample Preparation baghouse shall control process streams from the sample preparation building crushing and grinding equipment. This baghouse shall be sized to handle at least 4,200 DSCFM. All exhaust air from the sample preparation crusher and grinder shall be routed through the baghouse before being vented to the atmosphere. [R307-401-8]
II.B.2.f	The Electrowinning Acid Mist Eliminator shall control process streams from the electrowinning cells. This mist eliminator shall be sized to handle at least 8,000 actual CFM. Except during service, inspection, and cathode harvest, all exhaust air from the electrowinning cells shall be routed through the mist eliminator before being vented to the atmosphere. [R307-401-8]
II.B.2.g	The solvent extraction tanks and the stripping mixer/settlers shall be covered at all times except during inspection, sampling, and adjustment. [R307-401-8]
II.B.2.h	The concrete batch plant baghouse shall control all process streams from the 25 cubic yard concrete batch plant listed in Condition II.A.12. This baghouse shall be sized to handle at least 3,900 DSCFM. All exhaust air from the concrete batch plant shall be routed through the baghouse before being vented to the atmosphere. [R307-401-8]

II.B.2.i	The owner/operator shall only combust diesel fuel that meets the definition of ultra-low sulfur diesel (ULSD), which has a sulfur content of 15 ppm or less. [R307-401-8]
II.B.2.i.1	To demonstrate compliance with the ULSD fuel requirement, the owner/operator shall maintain records of diesel fuel purchase invoices or obtain certification of sulfur content from the diesel fuel supplier. The diesel fuel purchase invoices shall indicate that the diesel fuel meets the ULSD requirements. [R307-401-8]
II.B.3	**Roads and Fugitive Dust**
II.B.3.a	The owner/operator shall abide by a FDCP acceptable to the Director for control of all dust sources associated with the BCM. The FDCP shall be updated and submitted on an annual basis to the Director by February 1 of every year. This plan shall contain sufficient controls to prevent an increase in PM_{10} emissions above those modeled for this AO. The haul road length, speed, or any other parameters used to calculate the emissions cannot be changed without prior approval from the Director, if the change would result in an increase in emissions above the limitations set in the FDCP. [R307-309]
II.B.3.b	The BCM shall comply with all applicable requirements of UAC R307-205 and R307-309 for Fugitive Emission and Fugitive Dust sources. The provisions of R307-205 and R307-309 shall not apply to any sources for which limitations for fugitive dust or fugitive emissions are assigned pursuant to R307-401 or R307-305 nor shall they apply to agricultural or horticultural activities. [R307-309]
II.B.3.c	Control of disturbed or stripped areas is required at all times (24 hours per day every day) for the duration of the project/operation until the area is reclaimed. Records of disturbed area, treatment and/or reclamation shall be kept for all periods when the BCM is in operation. [R307-309]
II.B.3.d	Visible fugitive dust emissions from haul-road traffic and mobile equipment in operational areas shall not exceed 20% opacity at any point. Visible emission determinations shall use procedures similar to Method 9. The normal requirement for observations to be made at 15-second intervals over a six-minute period, however, shall not apply. Visible emissions shall be measured at the densest point of the plume but at a point not less than 1/2 vehicle length behind the vehicle and not less than 1/2 the height of the vehicle. [R307-309]
II.B.3.e	Water sprays, chemical dust suppression sprays or enclosures shall be installed at the following points that are not enclosed or have baghouses to control fugitive emissions: A. All stationary and portable conveyor transfer points B. All portable crusher input and output points, and screening unit points or partial enclosures. The sprays shall operate whenever dry conditions warrant or as determined necessary by the Director. [R307-309]
II.B.3.f	The accessible surfaces of all uncovered storage piles shall be sprayed with water or chemical dust suppressants to minimize generation of fugitive dusts, as dry conditions warrant or as determined necessary by the Director. Records of water and/or chemical dust control treatment shall be kept for all periods when the plant is in operation. [R307-309]

II.B.3.g NEW	The opacity on active waste slopes shall not exceed 20%. A visual opacity survey of waste dump activity shall be performed on a monthly basis. If visible emissions are observed, an opacity observation shall be performed by a certified observer within 24 hours. Opacity observations shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9, but the requirement for observations to be made at 15-second intervals over a six-minute period shall not apply. At any time, the owner/operator may propose a compliance method to UDAQ for approval prior to implementation. [R307-309]
II.B.3.h	The owner/operator shall use frequent watering or chemical dust suppressant to control road dust from all trafficked roads and areas in the mine. The owner/operator shall submit an annual road dust control report, in conjunction with the FDCP, by February 1 of each calendar year, containing as a minimum the following: A. A description of what dust control measures are planned for the coming year B. A report of what dust control measures were actually completed during the past year C. Specific elements of the report will include: 1) A map of all trafficked areas and roads associated with the mine, indicating which areas are planned for water and/or chemical dust suppressant treatment. 2) A description of the chemical dust suppressant and how it will be applied (application rate, application frequency, dilution rate, special application procedure, scarification, etc.). 3) A list of equipment dedicated either full or part time to the work area and for road dust control (number of water trucks, water capacity, number of graders, etc.). 4) A quantification of how much dust suppressant (gallons, tons) was applied the previous year and when and where it was applied. 5) A quantification of how much watering was accomplished the previous year (gallons, water truck operating hours). 6) A map outlining the pit influence boundary. [R307-309]
II.B.3.i	Wet drilling shall be performed for all blast holes. [R307-309]
II.B.3.j	To minimize fugitive dust on roads at the BCM, the owner/operator shall perform the following measures: A. Apply water to all active haul roads located at the BCM as conditions warrant and in accordance with the FDCP, and shall 1) ensure the surface of the active haul roads located within the pit influence boundary consists of road base material, blasted waste rock, crushed rock, or chemical dust suppressant, and 2) apply a chemical dust suppressant to active haul roads located outside of the pit influence boundary no less than twice per year.

	B. Ore conveyors shall be the primary means for transport of crushed ore from the BCM to the Copperton Concentrator. C. Chemical dust suppressant shall be applied on unpaved access roads that receive haul truck traffic and light vehicle traffic as defined in the FDCP. D. The owner/operator shall use graders to perform haul road maintenance and clean-up activities as well as other operational functions. [R307-309-10] E. If, for a 12-month period, the material movement by haul trucks is below 197,000,000 tpy of ore and waste rock combined, the owner/operator may petition the Director to revise the fugitive dust control measures above. [R307-309-10]
II.B.4	**Monitoring Requirements**
II.B.4.a	The owner/operator shall operate two ambient monitoring stations to monitor PM_{10} in Copperton and lower Butterfield Canyon area as approved by the Director. The monitoring plan will be periodically reviewed and revised as necessary. Any changes must be approved by the Director. The air monitoring stations shall remain in operation, at a minimum, until the BCM material moved has achieved a minimum of 234,000,000 TPY. If after that amount of material moved has been achieved and monitoring data indicates compliance with the NAAQS, the owner/operator may petition the Director to remove the air monitoring stations. [R307-410]
II.B.4.b	The owner/operator shall utilize federal reference method (FRM) or federal equivalent method PM_{10} monitors as specified in 40 CFR 53 and quality assurance procedures which are equal to or exceed the requirements described in the EPA Quality Assurance Manual including revisions, 40 CFR Parts 50, 53 and 58. [R307-410]
II.B.4.c NEW	If the PM_{10} concentrations measured are greater than 135 ug/m3 (90% of the 24-hr PM_{10} NAAQS) and if such concentrations have been measured for more than one day per year on an average over three consecutive years, the owner/operator shall conduct a review of mine operations and other potential sources and conditions such as the Natural Events Exception Criteria. If it is determined the BCM impacts the elevated ambient PM_{10} concentrations, the owner/operator shall work with DAQ to review control practices and possible changes in practices to avoid future elevated concentrations. [R307-410]
II.B.4.d NEW	The owner/operator shall submit quarterly data reports within 45 days after the end of the calendar quarter and an annual data report within 90 days after the end of the calendar year. The quarterly report shall consist of a narrative data summary and a submittal of all data points in EPA-AIRS record format. The data shall be submitted on a compact disk (CD). The narrative data summary shall include: A. A topographic map of appropriate scale with UTM coordinates and a true north arrow showing the air monitoring site locations in relation to the mine and the general area; B. A hard copy of the individual data points;

C. The quarterly and monthly arithmetic means for PM_{10} at actual temperature and pressure;

D. The first and second highest 24-hour concentrations for PM_{10};

E. The quarterly and monthly wind roses;

F. A summary of the data collection completeness;

G. A summary of the reasons for missing data;

H. An audit summary;

I. A summary of any ambient air PM_{10} exceedances;

J. Calibration information; and

K. Laboratory reports (for exceedance filters).

The annual data report shall consist of a narrative data summary containing:

A. A topographic map of appropriate scale with UTM coordinates and a true north arrow showing the air monitoring site locations in relation to the mine and the general area;

B. A pollution trend analysis;

C. The annual arithmetic means for PM_{10};

D. The first and second highest 24-hour concentrations for PM_{10};

E. The annual wind rose;

F. Annual summaries of data collection frequency and completeness;

G. An annual summary of audit data;

H. An annual summary of any ambient standard exceedance;

I. Annual mine material moved in TPY;

J. Annual summary of analytical speciation results for detectible metals (for exceedance filters); and

K. Recommendations on future monitoring.

The Director reserves the right to audit the air monitoring network, the laboratory performing associated analysis, and any data handling procedures at unspecified times. On the basis of the audits and subsequent reports, DAQ reserves the right to recommend or require changes in the air monitoring system and associated activities in order to improve data quality and completeness. [R307-410]

II.B.4.e	The owner/operator shall contract with an independent firm to conduct quarterly performance audits of its PM_{10} monitors. Exposed PM_{10} filters that exceed 150 ug/m3 shall be analyzed for metals, and other constituents as requested by the Director. One filter blank per batch of ten filters or less shall also be submitted for analysis. [R307-410]
II.B.4.f	PM_{10} and meteorological data (wind speed, wind direction, and ambient temperature) shall be collected at each site. The meteorological tower shall be located within one mile of the monitor station. [R307-410]
II.B.5 NEW	**Emergency Generator Engine**
II.B.5.a NEW	The owner/operator shall not operate each emergency engine on site for more than 100 hours per rolling 12-month period during non-emergency situations. There is no time limit on the use of the engines during emergencies. [R307-401-8]
II.B.5.b NEW	To determine compliance with a rolling 12-month total, the owner/operator shall calculate a new 12-month total by the 20th day of each month using data from the previous 12 months. Records documenting the operation of each emergency engine shall be kept in a log and shall include the following: a. The date the emergency engine was used b. The duration of operation in hours c. The reason for the emergency engine usage. [R307-401-8]
II.B.5.c NEW	To determine the duration of operation, the owner/operator shall install a non-resettable hour meter for each emergency engine. [R307-401-8]
II.B.5.d NEW	KUC shall not exceed the following limits on the diesel fired emergency generators for the Ventilation System #6, # 7, 8, and #9: Testing of the diesel fired emergency generators shall be allowed between 8 am and 8 pm. Only one (1) diesel fired emergency generator shall be tested at the same time. [R307-410]

PERMIT HISTORY

When issued, the approval order shall supersede (if a modification) or will be based on the following documents:

Incorporates	Additional Information dated February 28, 2024
Is Derived From	NOI Dated dated February 9, 2024
Supersedes	DAQE-AN105710047-21 dated May 10, 2021
Incorporates	Additional Information dated April 18, 2024

REVIEWER COMMENTS

1. **Comment regarding Emission Estimates:**
The emergency generators PTE emissions estimates for PM_{10}, $PM_{2.5}$ NO_x, VOC, and CO were generated using Tier 4 specs for PM_{10} and PM 2.5, NO_x, CO and VOC emissions. The SO_x emissions were generated using AP-42 Chapter 3. The CO_2e calculated used table A-1 "Global Warming Potentials" from 40 Code of Federal Regulations (CFR) Part 98. The engines are all limited by 100 hours of operation per year (each). [Last updated May 1, 2024]

2. **Comment regarding Site Information:**
The Site Indicator (SI) number has two facilities associated with it. The Copperton Concentrator has the permit number DAQE-AN105710035-13 with the 10571 SI number. The Bingham Canyon Mine is regulated under permit number DAQE-AN105710037-15 with the 10571 SI number. These two permits have separate equipment lists and separate requirements. If the two facilities were to be combined, the source would still be considered a minor area source. The permits are held separate for historical purposes. [Last updated April 18, 2024]

3. **Comment regarding SIP Listed Source:**
Kennecott is a listed major source with conditions in Part H.12.g.i of the $PM_{2.5}$ Serious Nonattainment SIP. The $PM_{2.5}$ Serious Nonattainment SIP has been approved by the Air Quality Board but has not been approved by Region 8 EPA. The $PM_{2.5}$ Serious Nonattainment SIP conditions have been incorporated into the current appropriate AO. No additional SIP /permitting action is required for the addition of the new equipment. [Last updated May 22, 2024]

4. **Comment regarding SIP Source Requirements:**
Kennecott is a listed source with conditions in Part H.12.g.i of the $PM_{2.5}$ Serious Nonattainment SIP. The SIP requirement pertaining to the BCM are included in this permit already. [Last updated April 18, 2024]

5. **Comment regarding Permit Modification, Site Analysis:**
This permit modification is being conducted in conjunction with a permit modification for the concentrator to add equipment for underground mining operations. Both modifications were reviewed to determine if combined increase for both modifications triggered significant emissions increase per UAC R307-101-2. Both modifications combined emissions increase are as follows (tons per year): 0.44 of point source PM_{10}, 0.26 of $PM_{2.5}$, 1.28 of NO_x, 7.93 of CO, 1.12 of SO_x and 0.43 of VOC. The total combined emissions increase from both modifications does not trigger significant. [Last updated April 18, 2024]

6. **Comment regarding Offset Requirements:**
The Kennecott, Copperton BCM is located in a Nonattainment area for PM_{10}, $PM_{2.5}$ and Ozone. An analysis of the emissions increases for both modifications was conducted to determine if the emissions triggered significant which would require offsetting. The analysis determined that significant was not triggered which makes this a minor modification (not a major modification) so offsets are not required per UAC R307-403, UAC R307-420 and UAC-R307-421. [Last updated April 18, 2024]

7. **Comment regarding Kennecott Aggregation:**
UDAQ has previously divided Kennecott's operations into the following separate stationary sources;

Smelter and Refinery,
Central Laboratory, Tailings Impoundment, and Utah Power Plant
Bingham Canyon Mine and Copperton Concentrator, and
Bonneville Borrow Area Plant

These site aggregation determinations were addressed during implementation of the Title V and were separated by pollutant-emitting activities which belong to the same industrial grouping. Pollutant-emitting activities shall be considered as part of the same industrial grouping if they have the same two-digit code of the Standard Industrial Classification.

The Smelter and Refinery each have a separate AO but are combined into the same site ID 10346 and classified as a major source. The Central Laboratory, Tailings Impoundment and Utah Power Plant all have separate AOs and were historically combined into the same site ID 10572 when they were classified as a major source. When the Utah Power Plant AO was issued in 2020, site ID 10572 was no longer major source and the Title V permit was rescinded. All sites are currently minor sources. The Bingham Canyon Mine and Copperton Concentrator each have separate AOs and are combined into the same site ID 10571 and classified as a minor source (majority of PTE emissions are fugitives/tailpipe). The Bonneville Borrow Area Plant has a site ID 16035 and is classified as a minor source.

To determine major source classification, fugitive emissions are counted only if the source category is a listed source category. Mining activities are not a listed source category and the fugitive emissions are not counted towards source classification.
[Last updated May 22, 2024]

8. **Comment regarding New Equipment Conditions:**
The new equipment being added for this modification consists of two storage silos, a mixer dust collector and four emergency standby generators.

The storage silos and the mixer dust collector have a BACT limit of 10% opacity limit. The 10% BACT opacity limit is exist in the sitewide visible emissions limit, labeled "All other points except as defined in other conditions of this AO".

The emergency standby generators will have additional conditions added to the updated AO for tracking the non-emergency hours of operation and limits on when the engines can be tested. The sulfur content limit exist in the site wide condition and the limit is not just limited to emergency generators. [Last updated April 25, 2024]

9. **Comment regarding Point Source:**

The KUC BCM is classified as a minor source due to the amount of point sources emissions. The point source emissions are as follows; 9.86 TPY of PM_{10}, 1.68 TPY of $PM_{2.5}$, 0.003 TPY of SO_x, 2.01 TPY of NO_x, 3.97 TPY of CO and 1.81 TPY of VOCs. To determine major source classification, fugitive emissions are counted only if the source category is a listed source category. Mining activities are not a listed source category and the fugitive emissions are not counted towards source classification. [Last updated May 22, 2024]

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/UDAQ	Division of Air Quality
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
LB/YR	Pounds per year
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
VOC	Volatile organic compounds

State of Utah

SPENCER J. COX
Governor

DEIDRE HENDERSON
Lieutenant Governor

Department of
Environmental Quality

Kimberly D. Shelley
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

RN105710048

June 3, 2024

Brendan Murphy
Rio Tinto Kennecott Utah Copper LLC
4700 Daybreak Parkway
South Jordan, UT 84095

Dear Brendan Murphy,

Re: Engineer Review:
Modification to Approval Order to DAQE-AN105710047-21, to Add Paste Plant and Support Equipment
Project Number: N105710048

The DAQ requests a company representative review and sign the attached Engineer Review (ER). This ER identifies all applicable elements of the New Source Review permitting program. Rio Tinto Kennecott Utah Copper LLC should complete this review within **10 business days** of receipt.

Rio Tinto Kennecott Utah Copper LLC should contact **Tad Anderson** at (385) 306-6515 if there are questions or concerns with the review of the draft permit conditions. Upon resolution of your concerns, please email **Tad Anderson** at **tdanderson@utah.gov** the signed cover letter. Upon receipt of the signed cover letter, the DAQ will prepare an ITA for a 30-day public comment period. At the completion of the comment period, the DAQ will address any comments and will prepare an Approval Order (AO) for signature by the DAQ Director.

If Rio Tinto Kennecott Utah Copper LLC does not respond to this letter within **10 business days,** the project will move forward without source concurrence. If Rio Tinto Kennecott Utah Copper LLC has concerns that cannot be resolved and the project becomes stagnant, the DAQ Director may issue an Order prohibiting construction.

Approval Signature _____ 6/12/2024
(Signature & Date)

UTAH DIVISION OF AIR QUALITY
ENGINEER REVIEW

SOURCE INFORMATION

Project Number	N105710048
Owner Name	Rio Tinto Kennecott Utah Copper LLC
Mailing Address	4700 Daybreak Parkway South Jordan, UT, 84095
Source Name	Rio Tinto Kennecott Utah Copper LLC- Mine & Copperton Concentrator
Source Location	8362 W 10200 S Bingham Canyon, UT 84006
UTM Projection	407,000 m Easting, 4,493,000 m Northing
UTM Datum	NAD27
UTM Zone	UTM Zone 12
SIC Code	1021 (Copper Ores)
Source Contact	Jenny Esker
Phone Number	(801) 569-6494
Email	jenny.esker@riotinto.com
Billing Contact	Jenny Esker
Phone Number	(801) 569-6494
Email	jenny.esker@riotinto.com
Project Engineer	Tad Anderson, Engineer
Phone Number	(385) 306-6515
Email	tdanderson@utah.gov
Notice of Intent (NOI) Submitted	February 9, 2024
Date of Accepted Application	April 5, 2024

SOURCE DESCRIPTION

General Description
Rio Tinto Kennecott Utah Copper LLC (RTK) owns and operates the Bingham Canyon Mine (BCM) and the Copperton Concentrator. The BCM is an open pit mining operation located in the southwest corner of Salt Lake County, Utah. Ore from the mine is conveyed to the Copperton Concentrator located approximately five miles north of the open pit in Copperton, Utah where it is ground and treated to produce copper concentrate.

NSR Classification:
Minor Modification

Source Classification
Located in, Northern Wasatch Front O3 NAA, Salt Lake City UT $PM_{2.5}$ NAA, Salt Lake County
SO_2 NAA, Salt Lake County
Airs Source Size: B

Applicable Federal Standards
NSPS (Part 60), A: General Provisions
NSPS (Part 60), LL: Standards of Performance for Metallic Mineral Processing Plants
NSPS (Part 60), OOO: Standards of Performance for Nonmetallic Mineral Processing Plants
NSPS (Part 60), IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
NSPS (Part 60), JJJJ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines
MACT (Part 63), A: General Provisions
MACT (Part 63), ZZZZ: National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines
Title V (Part 70) Area Source

Project Proposal
Modification to Approval Order to DAQE-AN105710047-21, to Add Paste Plant and Support Equipment

Project Description
RTK is requesting a modification of BCM Approval Order (AO) DAQE-AN105710047-21 to install and operate facilities associated with underground mining operations. The underground mining operations include the use of a new Paste Plant with two storage silos, a mixer dust collector and four emergency standby generators for the employee ventilation systems.

The new storage silos, at the bottom of the mine, support the Paste Plant operations where RTK will make usable concrete from lime and other materials. The mixer dust collector captures emissions from the paste plant mixer process area, where lime and other materials are blended together to make useable concrete.

Process Description
The ore and waste rock at the BCM are transferred from the mining areas to other areas of the mine through a series of transfers using haul trucks and conveyor belts. Ore is transferred to the in-pit crusher with haul trucks from the shovel face and waste rock is hauled to dumping areas

with haul trucks. After the ore is crushed, it is conveyed to the Copperton Concentrator. Once the ore is processed at the concentrator, it is transferred to the smelter.

EMISSION IMPACT ANALYSIS

Modeling was submitted for PM_{10} and NO_2. A modeling memo was generated containing the summary DAQE-MN105710048-24 with recommended conditions for testing times and testing quantity. [Last updated April 25, 2024]

SUMMARY OF EMISSIONS

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

Criteria Pollutant	Change (TPY)	Total (TPY)
CO_2 Equivalent	718.29	9038.47
Carbon Monoxide	4.34	1712.04
Nitrogen Oxides	0.60	5842.71
Particulate Matter - PM_{10}	0.41	1519.62
Particulate Matter - PM_{10} (Fugitives)	0.00	1509.76
Particulate Matter - $PM_{2.5}$	0.23	369.44
Particulate Matter - $PM_{2.5}$ (Fugitives)	0.00	367.76
Sulfur Dioxide	0.01	7.44
Volatile Organic Compounds	0.19	314.32

Hazardous Air Pollutant	Change (lbs/yr)	Total (lbs/yr)
Total HAPs (CAS #THAPS)	100	3580
	Change (TPY)	**Total (TPY)**
Total HAPs	0.05	1.79

Note: Change in emissions indicates the difference between previous AO and proposed modification.

Review of BACT for New/Modified Emission Units

1. **BACT review regarding Equipment**

BACT has been conducted for the two storage silos, a mixer dust collector and four emergency standby generators. The following is a summary of the results.

Storage Silos
BACT was conducted for the storage silos by reviewing the RBLC. The RBLC and CARB databases identify vent filters/baghouses and enclosures as possible control technologies for limiting emissions from storage silos. Baghouses are more effective than enclosures in minimizing emissions from storage silos. BACT for the storage silos is the use of baghouses and a 10 % opacity limit.

Mixer Dust Collector/Baghouse
BACT was conducted for the mixer dust collector by reviewing the RBLC. The RBLC and CARB databases identify vent filters/baghouses and enclosures as possible control technologies for limiting emissions from mixer dust collectors. Baghouses are more effective than enclosures in minimizing emissions from mixer dust collectors. BACT for the mixer dust collector is the use of baghouses and a 10 % opacity limit.

Emergency Generators
BACT was conducted for the emergency generator engine by reviewing the RBLC. The following technologies were specified in the analysis: good combustion practices, maintenance and operating practices, use of low-sulfur diesel fuel, compliance with applicable NSPS IIII requirements, compliance with applicable NESHAP ZZZZ requirements and the use of SCR. All of the listed control technologies are technically feasible, except for SCR. For SCR systems to function effectively, exhaust temperatures must be 200 degree C to 500 degree C to enable catalyst activation. SCR control efficiencies are low during the first 20 to 30 minutes after engines start up during maintenance and testing. There are also complications controlling the excess ammonia during the engine startup during maintenance and testing from SCR use. SCR is not considered technically feasible for emergency units.

BACT for diesel-fired emergency engines, is the following:

Good combustion, maintenance, and operating practices
Use of low-sulfur diesel fuel
Compliance with applicable NSPS IIII requirements
Use of a tier certified engine
Limit on hours of operation for maintenance and testing operations
~~Compliance with applicable NESHAP ZZZZ requirements is not required~~
[Last updated May 31, 2024]

SECTION I: GENERAL PROVISIONS

The intent is to issue an air quality 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. **(New or Modified conditions are indicated as "New" in the Outline Label):**

I.1	The limits set forth in this AO shall not be exceeded without prior approval. [R307-401]
I.2	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.3	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 two (2) years. [R307-401-8]
I.4	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.5	The owner/operator shall comply with R307-150 Series. Inventories, Testing and Monitoring. [R307-150]
I.6	The owner/operator shall comply with UAC R307-107. General Requirements: Breakdowns. [R307-107]
I.7	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.8	The owner/operator shall submit documentation of the status of construction or modification to the Director within 18 months from the date of this AO. This AO may become invalid if construction is not commenced within 18 months from the date of this AO or if construction is discontinued for 18 months or more. To ensure proper credit when notifying the Director, send the documentation to the Director, attn.: NSR Section. [R307-401-18]

SECTION II: PERMITTED EQUIPMENT

The intent is to issue an air quality 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. **(New or Modified conditions are indicated as "New" in the Outline Label):**

II.A THE APPROVED EQUIPMENT

II.A.1	**KUC Bingham Mine** KUC operates the BCM. KUC removes ore from the BCM by drilling, blasting, crushing and hauling.

II.A.2	**Main In-pit Crusher** Main in-pit crusher Main in-pit crusher baghouse
II.A.3	**Portable Roadbase Crushers** Two portable crushing and screening plants used to crush material for road base Maximum crusher unit capacity 700 tons per hour, each
II.A.4	**Conveyors** Conveyors and two transfer points with baghouses (Baghouses C6/C7 and Baghouses C7/C8)
II.A.5	**Lime Silos** Lime silos with fabric type bin vent control units
II.A.6	**Sample Preparation Equipment** Sample preparation equipment with baghouse
II.A.7	**SX/EW plant** SX/EW plant with electrowinning acid mist eliminator
II.A.8	**Degreasers** Various degreasing parts washers
II.A.9	**Gasoline Fueling Stations**
II.A.10	**LPG-Fired Emergency Generators** Nine Liquefied Petroleum gas-fired emergency generators Site — Maximum Rating Lark Gate #1 — 107 Brake Horsepower (BHP) #2 — 49 BHP Production Control Building 6690 — 150 BHP Communications 6190 — 75 BHP Mandy's Landing — 75 BHP East Side Dump — 49 BHP Zelnora — 49 BHP SAM Site — 49 BHP Substation 2 — 49 BHP
II.A.11	**Diesel-Fired Emergency Generators** Nine diesel-fired emergency generators (4 NEW) 1) Support Generators 1-5 1. Maximum rating 2,250 kW 2. Maximum rating 700 kW 3. Maximum rating 700 kW 4. Maximum rating 500 kW 5. Maximum rating 2,000 kW 2) Ventilation System Generators 6-9 (NEW)

	6. Maximum rating 2,000 kW 7. Maximum rating 2,000 kW 8. Maximum rating 2,000 kW 9. Maximum rating 3,250 kW
II.A.12	**Concrete Batch Plant** 1) One 25 cubic yard per hour batch plant controlled by a baghouse 2) One cement storage silo controlled by a baghouses 3) Conveyors and cement trucks 4) Storage silos with fabric filters
II.A.13	**Crushers and Screens** Portable crushing and screening plants with associated conveyors used to crush ore and waste rock. Conveyors partially enclosed transfer points or water sprays
II.A.14	**Underground Mining Support Equipment** 1) One (1) 150 cubic yard per hour batch plant controlled by baghouse a) One (1) cement storage silo with a baghouse b) Conveyors and cement trucks c) Storage silos with fabric filters 2) One (1) natural gas-fired boiler - 2.0 MMBTU/hr 3) One (1) natural gas-fired boiler - 4.0 MMBTU/hr 4) Three (3) diesel-fired heaters - 4.2 MMBTU/hr (each) 5) One (1) diesel-fired generator - 71 kW
II.A.15 NEW	**Paste Plant (NEW)** 1. Two (2) Storage silos with baghouse 2. One (1) Mixer Dust Collector with baghouse

SECTION II: SPECIAL PROVISIONS

The intent is to issue an air quality 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. **(New or Modified conditions are indicated as "New" in the Outline Label):**

II.B REQUIREMENTS AND LIMITATIONS

II.B.1	**Limitations and Test Procedures**
II.B.1.a NEW	Emissions at all times from the indicated emission points after primary control shall not exceed the following rates and concentrations: A. Main In-Pit Crusher Baghouse Vent Pollutant lb/hr grains per dry standard cubic foot (dscf) (68 F, 29.92 in Hg)

	PM_{10} 1.77 0.016 $PM_{2.5}$ 0.78 0.007 B. Controlled Drop Point Baghouse Vent (C6/C7, located outside of the pit) Pollutant lb/hr grains per dry standard cubic foot (dscf) (68 F, 29.92 in Hg) PM_{10} 0.31 0.007 C. Controlled Drop Point Baghouse Vent (C7/C8, located outside of the pit) Pollutant lb/hr grains per dry standard cubic foot (dscf) (68 F, 29.92 in Hg) PM_{10} 0.19 0.007. [R307-401-8]
II.B.1.b NEW	Stack testing to show compliance with the emission limitations stated in the above condition shall be performed as specified below: A. Emissions Point — Pollutant — Testing Status — Test Frequency Main In-Pit Crusher Baghouse Vent — PM_{10} — * — # $PM_{2.5}$ — * — # Controlled Drop Point Baghouse Vent (C6/C7, located outside of the pit) — PM_{10} — * — # Controlled Drop Point Baghouse Vent (C7/C8, located outside of the pit) — PM_{10} — * — # B. Testing Status * The initial testing has already been performed. # Test every three years. If a unit is not in operation when a test is due, the owner/operator may request an extension for the test. C. Notification The Director shall be notified at least 30 days prior to conducting any required emission testing. A source test protocol shall be submitted with the testing notification is submitted to the Director. The source test protocol shall be approved by the Director prior to performing the test(s). The source test protocol shall outline the proposed test methodologies, and stack to be tested. A pretest conference shall be held, if directed by the Director. D. Sample Location

	The emission point shall be designed to conform to the requirements of 40 CFR60, Appendix A, Method 1, or other EPA approved methods acceptable to the Director. An Occupational Safety and Health Administration (OSHA) or Mine Safety and Health Administration (MSHA) approved access shall be provided to the test location. E. Volumetric Flow Rate 40 CFR 60, Appendix A, Method 2 or other EPA approved testing methods acceptable to the Director. F. $PM_{10}/PM_{2.5}$ For stacks in which no liquid drops are present, the following methods shall be used: 40 CFR 51, Appendix M, Methods 201 or 201a or other EPA-approved testing method acceptable to the Director. The back half condensable particulate emissions shall also be tested (where applicable) using 40 CFR 51, Appendix M Method 202, or other EPA-approved testing method acceptable to the Director. All particulate captured using Method 202 shall be considered $PM_{2.5}$ and/or PM_{10}. For stacks in which liquid drops are present, methods to eliminate the liquid drops shall be explored. If no reasonable method to eliminate the drops exists, then the following methods shall be used: 40 CFR 60, Appendix A, Method 5, 5a, 5d, 5i or other as appropriate. If using Method 5 or any variation of Method 5, a scanning electron microscopy analysis or other equivalent method shall be used to determine the fraction of PM_{10} and/or $PM_{2.5}$, as approved by the Director. The back half condensable particulate emissions shall also be tested using 40 CFR 51, Appendix M Method 202 or other EPA-approved testing method acceptable to the Director. All particulate captured using Method 202 shall be considered $PM_{2.5}$ and/or PM_{10}. For filterable emission limits, condensable emissions shall not be used for compliance demonstrations. For filterable + condensable emission limits, both filterable and condensable emissions shall be used for compliance demonstrations. [R307-401-8]
II.B.1.c	G. Calculations To determine mass emission rates (lb/hr, etc.) the pollutant concentration as determined by the appropriate methods above shall be multiplied by the volumetric flow rate and any necessary conversion factors determined by the Director, to give the results in the specified units of the emission limitation. H. Source Operation For a new source/emission point, the production rate during all compliance testing shall be no less than 90% of the production capacity of the equipment. If the maximum production capacity has not been achieved at the time of the test, the following procedure shall be followed: 1) Testing shall be at no less than 90% of the production rate achieved to date. 2) If the test is passed, the new maximum allowable production rate shall be 110% of the tested achieved rate. This new allowable maximum production rate shall remain in effect until successfully tested at a higher rate. This

	process may be repeated until the maximum AO production rate is achieved. For an existing source/emission point, the production rate during all compliance testing shall be no less than 90% of the maximum production achieved in the previous three years. [R307-401-8]
II.B.1.d NEW	Visible emissions from the following emission points shall not exceed the following values: A. Main In-Pit crusher baghouse vent — 7% opacity B. Controlled drop point baghouse vent (C6/C7, located outside of the pit) — 7% opacity C. Controlled drop point baghouse vent (C7/C8, located outside of the pit) — 7% opacity D. Concrete batch plant baghouse — 10% opacity E. All other conveyor transfer points — 10% opacity F. Lime silos — 10% opacity G. Sample preparation equipment with baghouse — 10% opacity H. Drilling — 10% opacity I. LP gas-fired emergency generators — 10% opacity J. Nonmetallic Mineral Processing Screens and Conveyors — 7% opacity K. Nonmetallic Mineral Processing Crushers — 12% opacity L. Metallic Mineral Processing Equipment — 10% opacity M. Electrowinning Plant with electrowinning acid mist eliminator — 15% opacity N. All other points except as defined in other conditions of this AO — 10% opacity O. Diesel-fired Equipment — 20% opacity Opacity observations of emissions from stationary sources shall be conducted according to 40 CFR 60, Appendix A, Method 9. [R307-201]

II.B.1.e	For sources that are subject to NSPS, opacity shall be determined in accordance with 40 CFR 60.11(b) and 40 CFR 60, Appendix A, Method 9. It is the responsibility of the owner/operator of the source to supply these observations to the Director. A current certified observer must be used for these observations. Emission points that are subject to the initial observations are: A. All crushers B. All screens C. All conveyor transfer points. [40 CFR 60 Subpart A]
II.B.1.f	The following limits shall not be exceeded: A. Total material moved (ore and waste) shall not exceed 260,000,000 tons per rolling 12-month period*. B. Annual emissions of SO_2 shall not exceed 7 tons per rolling 12-month period. C. Maximum total mileage per calendar day for diesel-powered ore and waste haul trucks shall not exceed 30,000 miles. D. Minimum design payload per ore and waste haul truck shall not be less than 240 tons. Minimum design payload for trucks hauling material to develop new mining technologies, and material from maintenance activities shall not be less than 40 tons. Trucks used for underground development and operation may be smaller depending on application. E. Maximum number of wheels per ore or waste haul truck shall not exceed six wheels. F. Height of mine waste dump lift shall not exceed 1000 feet. G. The surface area of the Solvent Extraction/Electrowinning Plant mixer/settlers shall not exceed 1,100 ft^2. *Total ore and waste limitation shall be applied to dry tons of new material mined at the production shovels face. The owner/operator shall determine compliance with the 12-month period limits on a rolling 12-month total. The owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. The owner/operator shall keep records of daily total mileage for all periods when the mine is in operation. The owner/operator shall track haul truck miles with a Global Positioning System or equivalent. The system shall use real time tracking to determine daily mileage. SO_2 emissions from fuel burning shall be determined using the following formula: SO_2 tpy = (gal fuel/year)*(7.05 lb/gal)*(%S by wt.)/2000 lb/ton*(2 lb SO_2/lb S). [R307-401-8]

II.B.1.g	The following site-wide emission limits at the BCM shall not be exceeded: A. 7,350 tons of NO_x, PM_{10} and SO_2 combined per rolling 12-month period. B. 6,205 tons of NO_x, $PM_{2.5}$ and SO_2 combined per rolling 12-month period. The owner/operator shall determine compliance with the 12-month period limits on a rolling 12-month total per methodology outlined in Appendix A. The owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. [R307-401-8]
II.B.2	**Equipment Requirements**
II.B.2.a	The Main In-Pit Crusher Baghouse shall control process streams from the Main In-Pit Crusher. This baghouse shall be sized to handle at least 12,898 Dry Standard Cubic Feet per Minute (DSCFM). All exhaust air from the Main In-Pit Crusher shall be routed through the baghouse before being vented to the atmosphere. [R307-401-8]
II.B.2.b	The lime silos fabric bin vent control units shall control process streams from the lime silos. This control unit shall be sized to handle at least 616 DSCFM. All exhaust air from the lime silos shall be routed through the control unit before being vented to the atmosphere. [R307-401-8]
II.B.2.c	The Controlled Transfer Drop Point C6/C7 baghouse shall control process streams from the drop point. This baghouse shall be sized to handle at least 5,120 DSCFM. All exhaust air from the C6/C7 transfer drop point shall be routed through the baghouse before being vented to the atmosphere. [R307-401-8]
II.B.2.d	The Controlled Transfer Drop Point C7/C8 baghouse shall control process streams from the drop point. This baghouse shall be sized to handle at least 3,168 DSCFM. All exhaust air from the C7/C8 transfer drop point shall be routed through the baghouse before being vented to the atmosphere. [R307-401-8]
II.B.2.e	The Sample Preparation baghouse shall control process streams from the sample preparation building crushing and grinding equipment. This baghouse shall be sized to handle at least 4,200 DSCFM. All exhaust air from the sample preparation crusher and grinder shall be routed through the baghouse before being vented to the atmosphere. [R307-401-8]
II.B.2.f	The Electrowinning Acid Mist Eliminator shall control process streams from the electrowinning cells. This mist eliminator shall be sized to handle at least 8,000 actual CFM. Except during service, inspection, and cathode harvest, all exhaust air from the electrowinning cells shall be routed through the mist eliminator before being vented to the atmosphere. [R307-401-8]
II.B.2.g	The solvent extraction tanks and the stripping mixer/settlers shall be covered at all times except during inspection, sampling, and adjustment. [R307-401-8]
II.B.2.h	The concrete batch plant baghouse shall control all process streams from the 25 cubic yard concrete batch plant listed in Condition II.A.12. This baghouse shall be sized to handle at least 3,900 DSCFM. All exhaust air from the concrete batch plant shall be routed through the baghouse before being vented to the atmosphere. [R307-401-8]

II.B.2.i	The owner/operator shall only combust diesel fuel that meets the definition of ultra-low sulfur diesel (ULSD), which has a sulfur content of 15 ppm or less. [R307-401-8]
II.B.2.i.1	To demonstrate compliance with the ULSD fuel requirement, the owner/operator shall maintain records of diesel fuel purchase invoices or obtain certification of sulfur content from the diesel fuel supplier. The diesel fuel purchase invoices shall indicate that the diesel fuel meets the ULSD requirements. [R307-401-8]
II.B.3	**Roads and Fugitive Dust**
II.B.3.a	The owner/operator shall abide by a FDCP acceptable to the Director for control of all dust sources associated with the BCM. The FDCP shall be updated and submitted on an annual basis to the Director by February 1 of every year. This plan shall contain sufficient controls to prevent an increase in PM_{10} emissions above those modeled for this AO. The haul road length, speed, or any other parameters used to calculate the emissions cannot be changed without prior approval from the Director, if the change would result in an increase in emissions above the limitations set in the FDCP. [R307-309]
II.B.3.b	The BCM shall comply with all applicable requirements of UAC R307-205 and R307-309 for Fugitive Emission and Fugitive Dust sources. The provisions of R307-205 and R307-309 shall not apply to any sources for which limitations for fugitive dust or fugitive emissions are assigned pursuant to R307-401 or R307-305 nor shall they apply to agricultural or horticultural activities. [R307-309]
II.B.3.c	Control of disturbed or stripped areas is required at all times (24 hours per day every day) for the duration of the project/operation until the area is reclaimed. Records of disturbed area, treatment and/or reclamation shall be kept for all periods when the BCM is in operation. [R307-309]
II.B.3.d	Visible fugitive dust emissions from haul-road traffic and mobile equipment in operational areas shall not exceed 20% opacity at any point. Visible emission determinations shall use procedures similar to Method 9. The normal requirement for observations to be made at 15-second intervals over a six-minute period, however, shall not apply. Visible emissions shall be measured at the densest point of the plume but at a point not less than 1/2 vehicle length behind the vehicle and not less than 1/2 the height of the vehicle. [R307-309]
II.B.3.e	Water sprays, chemical dust suppression sprays or enclosures shall be installed at the following points that are not enclosed or have baghouses to control fugitive emissions: A. All stationary and portable conveyor transfer points B. All portable crusher input and output points, and screening unit points or partial enclosures. The sprays shall operate whenever dry conditions warrant or as determined necessary by the Director. [R307-309]
II.B.3.f	The accessible surfaces of all uncovered storage piles shall be sprayed with water or chemical dust suppressants to minimize generation of fugitive dusts, as dry conditions warrant or as determined necessary by the Director. Records of water and/or chemical dust control treatment shall be kept for all periods when the plant is in operation. [R307-309]

II.B.3.g NEW	The opacity on active waste slopes shall not exceed 20%. A visual opacity survey of waste dump activity shall be performed on a monthly basis. If visible emissions are observed, an opacity observation shall be performed by a certified observer within 24 hours. Opacity observations shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9, but the requirement for observations to be made at 15-second intervals over a six-minute period shall not apply. At any time, the owner/operator may propose a compliance method to UDAQ for approval prior to implementation. [R307-309]
II.B.3.h	The owner/operator shall use frequent watering or chemical dust suppressant to control road dust from all trafficked roads and areas in the mine. The owner/operator shall submit an annual road dust control report, in conjunction with the FDCP, by February 1 of each calendar year, containing as a minimum the following: A. A description of what dust control measures are planned for the coming year B. A report of what dust control measures were actually completed during the past year C. Specific elements of the report will include: 1) A map of all trafficked areas and roads associated with the mine, indicating which areas are planned for water and/or chemical dust suppressant treatment. 2) A description of the chemical dust suppressant and how it will be applied (application rate, application frequency, dilution rate, special application procedure, scarification, etc.). 3) A list of equipment dedicated either full or part time to the work area and for road dust control (number of water trucks, water capacity, number of graders, etc.). 4) A quantification of how much dust suppressant (gallons, tons) was applied the previous year and when and where it was applied. 5) A quantification of how much watering was accomplished the previous year (gallons, water truck operating hours). 6) A map outlining the pit influence boundary. [R307-309]
II.B.3.i	Wet drilling shall be performed for all blast holes. [R307-309]
II.B.3.j	To minimize fugitive dust on roads at the BCM, the owner/operator shall perform the following measures: A. Apply water to all active haul roads located at the BCM as conditions warrant and in accordance with the FDCP, and shall 1) ensure the surface of the active haul roads located within the pit influence boundary consists of road base material, blasted waste rock, crushed rock, or chemical dust suppressant, and 2) apply a chemical dust suppressant to active haul roads located outside of the pit influence boundary no less than twice per year.

	B. Ore conveyors shall be the primary means for transport of crushed ore from the BCM to the Copperton Concentrator. C. Chemical dust suppressant shall be applied on unpaved access roads that receive haul truck traffic and light vehicle traffic as defined in the FDCP. D. The owner/operator shall use graders to perform haul road maintenance and clean-up activities as well as other operational functions. [R307-309-10] E. If, for a 12-month period, the material movement by haul trucks is below 197,000,000 tpy of ore and waste rock combined, the owner/operator may petition the Director to revise the fugitive dust control measures above. [R307-309-10]
II.B.4	**Monitoring Requirements**
II.B.4.a	The owner/operator shall operate two ambient monitoring stations to monitor PM_{10} in Copperton and lower Butterfield Canyon area as approved by the Director. The monitoring plan will be periodically reviewed and revised as necessary. Any changes must be approved by the Director. The air monitoring stations shall remain in operation, at a minimum, until the BCM material moved has achieved a minimum of 234,000,000 TPY. If after that amount of material moved has been achieved and monitoring data indicates compliance with the NAAQS, the owner/operator may petition the Director to remove the air monitoring stations. [R307-410]
II.B.4.b	The owner/operator shall utilize federal reference method (FRM) or federal equivalent method PM_{10} monitors as specified in 40 CFR 53 and quality assurance procedures which are equal to or exceed the requirements described in the EPA Quality Assurance Manual including revisions, 40 CFR Parts 50, 53 and 58. [R307-410]
II.B.4.c NEW	If the PM_{10} concentrations measured are greater than 135 ug/m3 (90% of the 24-hr PM_{10} NAAQS) and if such concentrations have been measured for more than one day per year on an average over three consecutive years, the owner/operator shall conduct a review of mine operations and other potential sources and conditions such as the Natural Events Exception Criteria. If it is determined the BCM impacts the elevated ambient PM_{10} concentrations, the owner/operator shall work with DAQ to review control practices and possible changes in practices to avoid future elevated concentrations. [R307-410]
II.B.4.d NEW	The owner/operator shall submit quarterly data reports within 45 days after the end of the calendar quarter and an annual data report within 90 days after the end of the calendar year. The quarterly report shall consist of a narrative data summary and a submittal of all data points in EPA-AIRS record format. The data shall be submitted on a compact disk (CD). The narrative data summary shall include: A. A topographic map of appropriate scale with UTM coordinates and a true north arrow showing the air monitoring site locations in relation to the mine and the general area; B. A hard copy of the individual data points;

	C. The quarterly and monthly arithmetic means for PM_{10} at actual temperature and pressure; D. The first and second highest 24-hour concentrations for PM_{10}; E. The quarterly and monthly wind roses; F. A summary of the data collection completeness; G. A summary of the reasons for missing data; H. An audit summary; I. A summary of any ambient air PM_{10} exceedances; J. Calibration information; and K. Laboratory reports (for exceedance filters). The annual data report shall consist of a narrative data summary containing: A. A topographic map of appropriate scale with UTM coordinates and a true north arrow showing the air monitoring site locations in relation to the mine and the general area; B. A pollution trend analysis; C. The annual arithmetic means for PM_{10}; D. The first and second highest 24-hour concentrations for PM_{10}; E. The annual wind rose; F. Annual summaries of data collection frequency and completeness; G. An annual summary of audit data; H. An annual summary of any ambient standard exceedance; I. Annual mine material moved in TPY; J. Annual summary of analytical speciation results for detectible metals (for exceedance filters); and K. Recommendations on future monitoring. The Director reserves the right to audit the air monitoring network, the laboratory performing associated analysis, and any data handling procedures at unspecified times. On the basis of the audits and subsequent reports, DAQ reserves the right to recommend or require changes in the air monitoring system and associated activities in order to improve data quality and completeness. [R307-410]

II.B.4.e	The owner/operator shall contract with an independent firm to conduct quarterly performance audits of its PM_{10} monitors. Exposed PM_{10} filters that exceed 150 ug/m3 shall be analyzed for metals, and other constituents as requested by the Director. One filter blank per batch of ten filters or less shall also be submitted for analysis. [R307-410]
II.B.4.f	PM_{10} and meteorological data (wind speed, wind direction, and ambient temperature) shall be collected at each site. The meteorological tower shall be located within one mile of the monitor station. [R307-410]
II.B.5 NEW	**Emergency Generator Engine**
II.B.5.a NEW	The owner/operator shall not operate each emergency engine on site for more than 100 hours per rolling 12-month period during non-emergency situations. There is no time limit on the use of the engines during emergencies. [R307-401-8]
II.B.5.b NEW	To determine compliance with a rolling 12-month total, the owner/operator shall calculate a new 12-month total by the 20th day of each month using data from the previous 12 months. Records documenting the operation of each emergency engine shall be kept in a log and shall include the following: a. The date the emergency engine was used b. The duration of operation in hours c. The reason for the emergency engine usage. [R307-401-8]
II.B.5.c NEW	To determine the duration of operation, the owner/operator shall install a non-resettable hour meter for each emergency engine. [R307-401-8]
II.B.5.d NEW	KUC shall not exceed the following limits on the diesel fired emergency generators for the Ventilation System #6, # 7, 8, and #9: Testing of the diesel fired emergency generators shall be allowed between 8 am and 8 pm. Only one (1) diesel fired emergency generator shall be tested at the same time. [R307-410]

PERMIT HISTORY

When issued, the approval order shall supersede (if a modification) or will be based on the following documents:

Incorporates	Additional Information dated February 28, 2024
Is Derived From	NOI Dated dated February 9, 2024
Supersedes	DAQE-AN105710047-21 dated May 10, 2021
Incorporates	Additional Information dated April 18, 2024

REVIEWER COMMENTS

1. **Comment regarding Emission Estimates:**
The emergency generators PTE emissions estimates for PM_{10}, $PM_{2.5}$ NO_x, VOC, and CO were generated using Tier 4 specs for PM_{10} and PM 2.5, NO_x, CO and VOC emissions. The SO_x emissions were generated using AP-42 Chapter 3. The CO_2e calculated used table A-1 "Global Warming Potentials" from 40 Code of Federal Regulations (CFR) Part 98. The engines are all limited by 100 hours of operation per year (each). [Last updated May 1, 2024]

2. **Comment regarding Site Information:**
The Site Indicator (SI) number has two facilities associated with it. The Copperton Concentrator has the permit number DAQE-AN105710035-13 with the 10571 SI number. The Bingham Canyon Mine is regulated under permit number DAQE-AN105710037-15 with the 10571 SI number. These two permits have separate equipment lists and separate requirements. If the two facilities were to be combined, the source would still be considered a minor area source. The permits are held separate for historical purposes. [Last updated April 18, 2024]

3. **Comment regarding SIP Listed Source:**
Kennecott is a listed major source with conditions in Part H.12.g.i of the $PM_{2.5}$ Serious Nonattainment SIP. The $PM_{2.5}$ Serious Nonattainment SIP has been approved by the Air Quality Board but has not been approved by Region 8 EPA. The $PM_{2.5}$ Serious Nonattainment SIP conditions have been incorporated into the current appropriate AO. No additional SIP /permitting action is required for the addition of the new equipment. [Last updated May 22, 2024]

4. **Comment regarding SIP Source Requirements:**
Kennecott is a listed source with conditions in Part H.12.g.i of the $PM_{2.5}$ Serious Nonattainment SIP. The SIP requirement pertaining to the BCM are included in this permit already. [Last updated April 18, 2024]

5. **Comment regarding Permit Modification, Site Analysis:**
This permit modification is being conducted in conjunction with a permit modification for the concentrator to add equipment for underground mining operations. Both modifications were reviewed to determine if combined increase for both modifications triggered significant emissions increase per UAC R307-101-2. Both modifications combined emissions increase are as follows (tons per year): 0.44 of point source PM_{10}, 0.26 of $PM_{2.5}$, 1.28 of NO_x, 7.93 of CO, 1.12 of SO_x and 0.43 of VOC. The total combined emissions increase from both modifications does not trigger significant. [Last updated April 18, 2024]

6. **Comment regarding Offset Requirements:**
The Kennecott, Copperton BCM is located in a Nonattainment area for PM_{10}, $PM_{2.5}$ and Ozone. An analysis of the emissions increases for both modifications was conducted to determine if the emissions triggered significant which would require offsetting. The analysis determined that significant was not triggered which makes this a minor modification (not a major modification) so offsets are not required per UAC R307-403, UAC R307-420 and UAC-R307-421. [Last updated April 18, 2024]

7. **Comment regarding Kennecott Aggregation:**
UDAQ has previously divided Kennecott's operations into the following separate stationary sources;

Smelter and Refinery,
Central Laboratory, Tailings Impoundment, and Utah Power Plant
Bingham Canyon Mine and Copperton Concentrator, and
Bonneville Borrow Area Plant

These site aggregation determinations were addressed during implementation of the Title V and were separated by pollutant-emitting activities which belong to the same industrial grouping. Pollutant-emitting activities shall be considered as part of the same industrial grouping if they have the same two-digit code of the Standard Industrial Classification.

The Smelter and Refinery each have a separate AO but are combined into the same site ID 10346 and classified as a major source. The Central Laboratory, Tailings Impoundment and Utah Power Plant all have separate AOs and were historically combined into the same site ID 10572 when they were classified as a major source. When the Utah Power Plant AO was issued in 2020, site ID 10572 was no longer major source and the Title V permit was rescinded. All sites are currently minor sources. The Bingham Canyon Mine and Copperton Concentrator each have separate AOs and are combined into the same site ID 10571 and classified as a minor source (majority of PTE emissions are fugitives/tailpipe). The Bonneville Borrow Area Plant has a site ID 16035 and is classified as a minor source.

To determine major source classification, fugitive emissions are counted only if the source category is a listed source category. Mining activities are not a listed source category and the fugitive emissions are not counted towards source classification.
[Last updated May 22, 2024]

8. **Comment regarding New Equipment Conditions:**
The new equipment being added for this modification consists of two storage silos, a mixer dust collector and four emergency standby generators.

The storage silos and the mixer dust collector have a BACT limit of 10% opacity limit. The 10% BACT opacity limit is exist in the sitewide visible emissions limit, labeled "All other points except as defined in other conditions of this AO".

The emergency standby generators will have additional conditions added to the updated AO for tracking the non-emergency hours of operation and limits on when the engines can be tested. The sulfur content limit exist in the site wide condition and the limit is not just limited to emergency generators. [Last updated April 25, 2024]

9. **Comment regarding Point Source:**

The KUC BCM is classified as a minor source due to the amount of point sources emissions. The point source emissions are as follows; 9.86 TPY of PM_{10}, 1.68 TPY of $PM_{2.5}$, 0.003 TPY of SO_x, 2.01 TPY of NO_x, 3.97 TPY of CO and 1.81 TPY of VOCs. To determine major source classification, fugitive emissions are counted only if the source category is a listed source category. Mining activities are not a listed source category and the fugitive emissions are not counted towards source classification. [Last updated May 22, 2024]

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/UDAQ	Division of Air Quality
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
LB/YR	Pounds per year
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
VOC	Volatile organic compounds

State of Utah

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Governor

DEIDRE HENDERSON
Lieutenant Governor

Department of
Environmental Quality

Kimberly D. Shelley
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQE-MN105710048-24

M E M O R A N D U M

TO: Tad Anderson, NSR Engineer TA

FROM: Dave Prey, Air Quality Modeler DP

DATE: April 24, 2024

SUBJECT: Modeling Analysis Review for the Notice of Intent for Rio Tinto Kennecott Utah Copper LLC- Bingham Canyon Mine, Salt Lake County, Utah

This is not a Major Prevention of Significant Deterioration (PSD) Source.

I. OBJECTIVE

Rio Tinto Kennecott Utah Copper LLC (RTK) is seeking an approval order for their Bingham Canyon Mine (BKM) located in Salt Lake County, Utah. The BCM is an open pit mining operation located in the southwest corner of Salt Lake County, Utah. Ore from the mine is conveyed to the Copperton Concentrator located approximately five miles north of the open pit in Copperton, Utah where it is ground and treated to produce copper concentrate. RTK is requesting a modification of BCM Approval Order (AO) DAQE-AN105710047-21 to install and operate facilities associated with underground mining operations. The underground mining operations include the use of a new Paste Plant with two storage silos, a mixer dust collector and four emergency standby generators for the employee ventilation systems.

This report, prepared by the Staff of the New Source Review Section (NSR), contains a review of the air quality impact analysis (AQIA) including the information, data, assumptions and modeling results used to determine if the facility would be in compliance with State and Federal concentration standards.

II. APPLICABLE RULE(S)

Utah Air Quality Rules:

R307-401-6	Condition for Issuing an Approval Order
R307-410-3	Use of Dispersion Models
R307-410-4	Modeling of Criteria Pollutants in Attainment Areas

III. MODELING METHODOLOGY

A. Applicability

Emissions from the facility include PM_{10}, NO_x, CO, SO_2, and HAPs. Modeling for NO_2 and PM_{10} was performed by RTK.

B. Assumptions

1. Topography/Terrain

The Plant is at an elevation 7383 feet with terrain features that have no affect on concentration predictions.

a. Zone: 12

b. Approximate Location:

UTM (NAD83): 403633 meters East
4484086 meters North

2. Urban or Rural Area Designation

After a review of the appropriate 7.5 minute quadrangles, it was concluded the area is "rural" for air modeling purposes.

3. Ambient Air

It was determined the Plant boundary used in the AQIA meets the State's definition of ambient air.

4. Building Downwash

The source was modeled with the AERMOD model. All structures at the plant were used in the model to account for their influence on downwash.

5. Meteorology

Five (5) years of off-site surface and upper air data were used in the analysis consisting of the following:

Surface – Herriman, UT UDAQ: 2016-2020
Upper Air – Salt Lake Airport, UT NWS: 2016-2020

6. Background

No background concentrations were needed for the Significant Impact Analysis (SIA).

7. Receptor and Terrain Elevations

The modeling domain used consisted of receptors including property boundary receptors. This area of the state contains mountainous terrain and the modeling domain has simple and complex terrain features in the near and far fields. Therefore, receptor points representing actual terrain elevations from the area were used in the analysis.

8. Model and Options

The State-accepted AERMOD model was used to predict air pollutant concentrations under a simple/complex terrain/wake effect situation. In quantifying concentrations, the regulatory default option was selected.

9. Air Pollutant Emission Rates

Source	UTM Coordinates		Modeled Emission Rates		
	Easting	Northing	Nox		
	(m)	(m)	(lb/hr)	(tons/yr)	hrs/year
PIT	403633	4484086	4.80	10.52	4380
Total			4.80	10.52	

Source	UTM Coordinates		Modeled Emission Rates		
	Easting	Northing	PM10		
	(m)	(m)	(lb/hr)	(tons/yr)	hrs/year
PIT	403633	4484086	0.2974	1.303	8760
Total			0.30	1.30	

10. Source Location and Parameters

Source	Type	Source Parameters				
		Elev,	Ht		Sigma-Y	Area
		(ft)	(m)	(ft)	(m)	(m^2)
PIT	AREA_POLY	7383.0	0.0	0.0	0.00	17516473.3

IV. RESULTS AND CONCLUSIONS

A. National Ambient Air Quality Standards

The below tables provide a comparison of the predicted total air quality concentrations with the Significant Impact Levels (SIL). The predicted concentrations are less than their respective SILs.

Air Pollutant	Period	Prediction ($\mu g/m^3$)	Class II Significant Impact Level ($\mu g/m^3$)	Background ($\mu g/m^3$)	Nearby Sources* ($\mu g/m^3$)	Total ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent SIL
NO_2	1-Hour	5.8	7.5				188	77.6%

Air Pollutant	Period	Prediction ($\mu g/m^3$)	Class II Significant Impact Level ($\mu g/m^3$)	Background ($\mu g/m^3$)	Nearby Sources* ($\mu g/m^3$)	Total ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent SIL
PM_{10}	24-Hour	0.09	5.0				150	1.9%

V. PERMIT CONDITIONS

The following suggested permit language should be included under the Terms and Conditions in the AO:

- Testing of the emergency generators shall be allowed between 8 am and 8 pm.
- Only one (1) emergency generator shall be tested at the same time.

DP:jg

RioTinto

Rio Tinto Kennecott
4700 Daybreak Parkway
South Jordan, Utah
84009
Tel: 801-204-2000

December 27, 2023

Mr. Bryce Bird – Director
Utah Division of Air Quality
195 N 1950 W
Salt Lake City, UT 84116

Subject: **Rio Tinto Kennecott Utah Copper LLC**
Bingham Canyon Mine and Copperton Concentrator

Dear Director Bird,

On May 31, 2023, the Utah Division of Air Quality (UDAQ) sent a letter to Rio Tinto Kennecott Utah Copper LLC (Kennecott) outlining potential impacts to the Bingham Canyon Mine and Copperton Concentrator resulting from designation of the Northern Wasatch Front to serious nonattainment classification in February 2025. The letter identified Kennecott's Bingham Canyon Mine and Copperton Concentrator as a potential major source for ozone (VOCs and NOx as precursors). This letter outlines that the Bingham Canyon Mine and Copperton Concentrator are not major sources under the serious nonattainament classification.

The Bingham Canyon Mine and Copperton Concentrator are a single source for Title V applicability, but the Copperton Concentrator operates under a separate Approval Order from the Bingham Canyon Mine. Under R307-101, a Major Source is defined as

> *"Major Source" means, to the extent provided by the federal Clean Air Act as applicable to Title R307:*
>
> *(1) any stationary source of air pollutants which emits, or has the potential to emit, one hundred tons per year or more of any pollutant subject to regulation under the Clean Air Act; or*
>
> *. . .*
>
> *(b) any source located in Salt Lake or Davis Counties or in a nonattainment area for ozone which emits, or has the potential to emit, VOC or nitrogen oxides in the amounts outlined in Section 182 of the federal Clean Air Act with respect to the severity of the nonattainment area as outlined in Section 182 of the federal Clean Air Act . . . .*

Utah Admin. Code 307-101-2

Emissions of stationary sources (point sources) at the Bingham Canyon Mine and the Copperton Concentrator are shown in Table 1. Table 1 shows that aggregated emissions from stationary sources at the Bingham Canyon Mine and Copperton Concentrator are below all major source thresholds and neither the

Bingham Canyon Mine nor Copperton Concentrator, individually or collectively, approach any major source threshold. The Bingham Canyon Mine and Copperton Concentrator are separate operating facilities and are therefore under separate Approval Orders.

Table 1
Combined Emissions, Mine and Concentrator

	Point Sources at Bingham Canyon Mine	Point Sources at Copperton Concentrator	Total Point Source Emissions	Major Source Thresholds
PM10 Emissions (tpy)	9.86	1.75	11.62	100
PM2.5 Emissions (tpy)	1.68	1.09	2.77	70
SO2 Emissions (tpy)	0.003	0.02	0.02	100
NOX Emissions (tpy)	2.01	6.83	8.84	50
CO Emissions (tpy)	3.97	3.36	7.33	100
VOC Emissions (tpy)	1.81	1.89	3.70	50

Based on emissions information listed in Table 1, the Bingham Canyon Mine and Copperton Concentrator are a minor source. As it has done as part of previous SIP planning, Kennecott will however participate in the ozone SIP process and submit a RACT analysis for these facilities. Despite Kennecott's participation in the ozone SIP process, Kennecott requests that the record clearly state that the Bingham Canyon Mine and Copperton Concentrator are minor sources.

If you have questions, please contact me at jenny.esker@riotinto.com.

Yours sincerely,

Jenny Esker Evans
Principal Advisor, Air Quality

Rio Tinto Kennecott
4700 Daybreak Parkway
South Jordan, Utah 84009
Tel: 801-204-2000

February 9, 2024

Mr. Bryce Bird – Director
Environmental Engineer, Air Quality Policy Section
Utah Division of Air Quality
195 N 1950 W
Salt Lake City, UT 84116

Subject: **Rio Tinto Kennecott Utah Copper**
Notice of Intent Application for Bingham Canyon Mine

Dear Mr. Bird,

Rio Tinto Kennecott Utah Copper LLC (RTK) is submitting this Notice of Intent (NOI) application to modify Bingham Canyon Mine Approval Order (AO) DAQE-AN105710047-21. RTK is proposing to install and operate facilities associated with underground mining operations. The Proposed Project includes a new Paste Plant with two storage silos and a mixer dust collector and four emergency standby generators to support employee ventilation systems (Proposed Project).

Process Description

At the Bingham Canyon Mine, as the underground mining operations develop, RTK proposes to add additional, auxiliary equipment to keep working conditions safe for employees. To ensure safety, RTK has improved infrastructure in the area; however, to ensure backup for the life safety systems, RTK proposes to add a total of four emergency standby generators. RTK plans to operate the proposed generators during emergency periods only, as necessary.

The proposed storage silos, which are to be located at the bottom of the mine, will support Paste Plant operations where RTK will make usable concrete from lime and other materials. The proposed silos will store lime and will be equipped with bin vents to capture dust emissions. The mixer dust collector will capture emissions from the paste plant mixer process area, where lime and other materials are blended together to make useable concrete.

Emissions Information

Emergency Standby Generators

Emissions will be generated during testing and maintenance of standby emergency generators. Three of the generators will be 2,000-kilowatt (kW) engines and the fourth will be a 3,250-kW engine. The generators will be equipped with U.S. Environmental Protection Agency (EPA) Tier 4 certified engines. The hours of operation for the generators will be limited to 100 hours per year for routine testing and maintenance purposes. Emissions are estimated using DieselNet Tier 4 emissions standards. Emissions of sulfur oxide (SO_X) are estimated using a mass balance from *AP-42 Fifth Edition*, Section 3.4, Table 3.4-1 (EPA 1996) and assuming the use of ultra-low sulfur diesel with a maximum sulfur content of 0.0015 percent by weight. Emissions of hazardous air pollutants (HAPs) are estimated using a combination of emission factors from *AP-42 Fifth Edition,* Section 3.4, Tables 3.4-3 and 3.4-4 (EPA 1996) and *Supplemental Instructions for Reporting Procedures for AB2588 Facilities for Reporting their*

Quadrennial Air Toxics Emission Inventory, Table B-2 for Stationary and Portable Internal Combustion Engines (South Coast Air Quality Management District 2016). Greenhouse gas emissions are estimated using the methodology outlined in 40 *Code of Federal Regulations* (CFR) 98.33, Equations C-2a and C-9a.

Proposed Project emissions are summarized in Table 1. The emissions calculations are included in Attachment A.

Storage Silos

The two proposed lime storage silos are to be equipped with bin vents to capture particulate emissions from the transfer of material. PM_{10} and $PM_{2.5}$ emissions are estimated using values provided in similar filter engineering documentation specifications and good engineering judgement. The silos will also be located within the pit influence boundary, and therefore the pit escape factor is used in emission calculations. Proposed Project emissions are summarized in Table 1. The emissions calculations are included in Attachment A.

Mixer Dust Collector

The paste plant mixer is to be equipped with a baghouse to capture particulate emissions from the mixing process. PM_{10} and $PM_{2.5}$ emissions are estimated using values provided in similar filter engineering documentation specifications and good engineering judgement. The dust collector will also be located within the pit influence boundary, and therefore the pit escape factor is used in emission calculations. Proposed Project emissions are summarized in Table 1. The emissions calculations are included in Attachment A.

Table 1. Summary of Proposed Project Emissions

Source	Potential Emissions in Tons Per Year							
	PM_{10}	**$PM_{2.5}$**	**SO_X**	**NO_X**	**VOC**	**CO**	**HAP**	**CO_2e**
2,000-kW Standby Generators	1.98E-02	1.98E-02	4.95E-03	4.50E-01	1.26E-01	2.34E+00	3.16E-02	4.70E+02
3,250-kW Standby Generator	1.06E-02	1.06E-02	2.64E-03	2.40E-01	6.72E-02	1.25E+00	1.66E-02	2.48E+02
Storage Silos	3.18E-01	1.67E-01	-	-	-	-	-	-
Mixer Dust Collector	5.92E-02	3.11E-02	-	-	-	-	-	-
Total Emissions	**4.07E-01**	**2.28E-01**	**7.60E-03**	**6.90E-01**	**1.93E-01**	**3.59E+00**	**4.82E-02**	**7.19E+02**

Notes:
- = not applicable
CO = carbon monoxide
CO_2e = carbon dioxide equivalent
HAP = hazardous air pollutant
NO_x = nitrogen oxide
$PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter
PM_{10} = particulate matter less than 10 micrometers in diameter
SO_x = sulfur oxide
VOC = volatile organic compound

Best Available Control Technology Analyses

As required by Utah Administrative Code (UAC) R307-401-8(1)(a), the Director will issue an AO if it is determined through plan review that the following condition has been met: the degree of pollution control

for emissions, to include fugitive emissions and fugitive dust, is at least best available control technology (BACT) except as otherwise provided in UAC R307. Utah has adopted the emissions control BACT process described in *40 Code of Federal Regulations* 52.21(j) and incorporated by reference into UAC R307-405-11.

BACT Analysis for Emergency Standby Generators

Combustion of diesel fuel from the use of the emergency standby generators will generate emissions. The following presents a BACT analysis for the proposed standby generators:

- **Step 1—Identify All Control Technologies.** Potential emission control technologies identified in the RACT/BACT/LAER Clearinghouse (RBLC) and California Air Resources Board (CARB) for similar-sized diesel standby generators include implementing good combustion practices, limiting hours of operation, and limiting the sulfur content of diesel fuel to 0.0015 percent. Certification and compliance with applicable New Source Performance Standards (NSPS) are acceptable means of demonstrating BACT for emergency fire pumps.
- **Step 2—Eliminate Technically Infeasible Options.** Not applicable as all identified control technologies are technically feasible.
- **Step 3 and Step 4—Rank Remaining Control Technologies by Control Effectiveness and Evaluate Most Effective Controls and Document Results.** Complying with 40 CFR Subpart IIII requirements, implementing good combustion practices, limiting hours of operation, and using ultra-low sulfur diesel are effective BACT in minimizing emissions from these sources.
- **Step 5—Select BACT.** Complying with 40 CFR Subpart IIII requirements and NSPS, implementing good combustion practices, limiting hours of operation to no more than 100 hours, and limiting the sulfur content of fuel to 0.0015 percent, are identified as BACT for the emergency standby diesel generators.

BACT Analysis for Storage Silos

Particulate emissions will be emitted from the lime storage silos. The following presents a BACT analysis for the proposed storage silos:

- **Step 1—Identify All Control Technologies.** The RBLC and CARB databases identify vent filters/baghouses and enclosures as possible control technologies for limiting emissions from storage silos.
- **Step 2—Eliminate Technically Infeasible Options.** Not applicable as all identified control technologies are technically feasible.
- **Step 3 and Step 4—Rank Remaining Control Technologies by Control Effectiveness and Evaluate Most Effective Controls and Document Results.** Baghouses are more effective than enclosures in minimizing emissions from storage silos.
- **Step 5—Select BACT.** Based on this analysis and review of EPA's RBLC database, the use of baghouses is selected as BACT for the storage silos.

BACT Analysis for Mixer Dust Collector

Particulate emissions will be emitted from the mixer dust collector. The following presents a BACT analysis for the proposed process:

- **Step 1—Identify All Control Technologies.** The RBLC and CARB databases identify vent filters/baghouses and enclosures as possible control technologies for limiting emissions from the lime mixing process.
- **Step 2—Eliminate Technically Infeasible Options.** Not applicable as all identified control technologies are technically feasible.

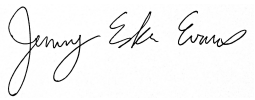
- **Step 3 and Step 4—Rank Remaining Control Technologies by Control Effectiveness and Evaluate Most Effective Controls and Document Results.** Baghouses are more effective than enclosures in minimizing emissions from the mixing process.
- **Step 5—Select BACT.** Based on this analysis and review of EPA's RBLC database, the use of baghouses is selected as BACT for the mixer process.

Modeling Analysis

RTK has performed an air dispersion modeling analysis using AERMOD for PM_{10} and nitrogen dioxide (NO_2), as discussed in conversations with the Utah Division of Air Quality. The modeled results from this analysis were compared to the applicable significant impact levels (SILs). The predicted impacts for the Proposed Project are less than the respective SILs. Therefore, the NO_2 and PM_{10} impacts from the Project are not significant and would not cause or contribute to a violation of the National Ambient Air Quality Standards. The results from this analysis are included in Attachment B.

RTK looks forward to working with the Utah Division of Air Quality on this NOI application. Should you have any questions, please feel free to contact me at (801) 569-6494.

Yours sincerely,



Jenny Esker
Principal Advisor, Air Quality Permitting and Compliance

Attachment A
Emissions Calculations

TABLE A-1
Potential to Emit Summary
Paste Plant Notice of Intent Application

	Potential Emissions in Tons Per Year							
Emission Sources	**PM_{10}**	**$PM_{2.5}$**	**SO_X**	**NO_X**	**VOC**	**CO**	**HAP**	**CO_2e**
2,000-kW Standby Generators	1.98E-02	1.98E-02	4.95E-03	0.450	1.26E-01	2.34E+00	3.16E-02	4.70E+02
3,250-kW Standby Generators	1.06E-02	1.06E-02	2.64E-03	0.240	6.72E-02	1.25E+00	1.66E-02	2.48E+02
Storage Silos	3.18E-01	1.67E-01	-	-	-	-	-	-
Mixer Dust Collector	5.92E-02	3.11E-02	-	-	-	-	-	-
Total Project Emissions	**4.07E-01**	**2.28E-01**	**7.60E-03**	**6.90E-01**	**1.93E-01**	**3.59E+00**	**4.82E-02**	**7.19E+02**
Current BCM PTEs	1,519.21	369.21	7.43	5,842.11	314.13	1,707.70	1.74	8,320.18
Post Project BCM PTEs	1,519.62	369.44	7.44	5,842.80	314.32	1,711.29	1.79	9,038.74

PTEs taken from AO DAQE-AN105710047-21.

Notes:
- = not applicable
AO = Approval Order
BCM = Bingham Canyon Mine
CO = carbon monoxide
CO_2e = carbon dioxide equivalent
HAP = hazardous air pollutant
kW = kilowatt
NO_x = nitrogen oxide
$PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter
PM_{10} = particulate matter less than 10 micrometers in diameter
PTE = potential to emit
SO_x = sulfur oxide
VOC = volatile organic compound

TABLE A-2

2,000-kW Standby Generators

Paste Plant Notice of Intent Application

Source Type	Annual Hours of Operation	Quanitity	Rating (hp)	Rating (kW)	Fuel Use (gal/hr)	PM_{10} Emissions (tpy)	$PM_{2.5}$ Emissions (tpy)	SO_X Emissions (tpy)	NO_X Emissions (tpy)	VOC Emissions (tpy)	CO Emissions (tpy)	Total HAP Emissions (tpy)
Paste Plant Standby Generators	100	3	2721	2000	138.9	0.02	0.02	4.95E-03	0.45	0.13	2.34	3.16E-02

Note:
Engines are EPA Tier 4

GHG Emissions Calculations

Source	Annual Hours of Operation	Fuel Use (gal/hr)	CO_2 Emissions (tpy)	CH_4 Emissions (tpy)	N_2O Emissions (tpy)	CO_2e Emissions (tpy)
Paste Plant Standby Generators	100	138.9	468.81	1.90E-02	3.80E-03	470.42

Notes:

Conversion	0.746	kw/hp	
Power conversion	3.412	Btu/hr per Watt	
Grams to lb conversion	0.002204624	lb/gram	453.592

Fuel consumption taken from manufacturer's specifications, assuming standby at 60 Hz, 100% load (pg 3, spec); Bhp rating taken from performance data at 100% load (pg 5, emiss spec).
Emissions taken from rated speed nominal data versus site variation data.
Assume PM_{10}=$PM_{2.5}$

Pollutant	Emission Factor	Units	Source
PM_{10}	0.022	g/bhp-hr	DieselNet Tier 4 specs for gensets >2015, >560kW
$PM_{2.5}$	0.022	g/bhp-hr	DieselNet Tier 4 specs for gensets >2015, >560kW
SO_x	0.000012135	lb/hp-hr	AP-42 Chapter 3 Table 3.4-1
NO_x	0.5	g/bhp-hr	DieselNet Tier 4 specs for gensets >2015, >560kW
VOC	0.14	g/bhp-hr	DieselNet Tier 4 specs for gensets >2015, >560kW
CO	2.6	g/bhp-hr	DieselNet Tier 4 specs for gensets >2015, >560kW
CO_2	73.96	kg/MMBtu	40 CFR 98.33 Table C-1
CH_4	0.003	kg/MMBtu	40 CFR 98.33 Table C-2
N_2O	0.0006	kg/MMBtu	40 CFR 98.33 Table C-2
Diesel heat rating	0.138	MMBtu/gal	40 CFR 98.33 Table C-1
Conversion	1.1023	ton/tonne	
Sulfur content of diesel	0.0015	percent	

GHG emissions are calculated using 40 CFR 98.33 Equation C-2a and C-9a.
DieselNet standards can be found at: https://dieselnet.com/standards/us/nonroad.php#tier4.

TABLE A-2

2,000-kW Standby Generators

Paste Plant Notice of Intent Application

HAP Emissions

Pollutant	AP-42 Emission Factor (lb/MMBtu)[a]	SCAQMD Emission Factor (lb/MMBtu)[b]	SCAQMD Emission Factor (lb/1000 gal)[c]	Proposed Emission Factor (lb/MMBtu)[d]	Emissions (lbs/yr)	Emissions (tons/yr)
Benzene	7.76E-04	1.35E-03	1.86E-01	7.76E-04	4.46E+00	2.23E-03
Toluene	2.81E-04	7.64E-04	1.05E-01	2.81E-04	1.62E+00	8.08E-04
Xylenes	1.93E-04	3.07E-04	4.24E-02	1.93E-04	1.11E+00	5.55E-04
1,3-Butadiene	--	1.58E-03	2.17E-01	1.58E-03	9.06E+00	4.53E-03
Formaldehyde	7.89E-05	1.25E-02	1.73E+00	7.89E-05	4.54E-01	2.27E-04
Acetaldehyde	2.52E-05	5.68E-03	7.83E-01	2.52E-05	1.45E-01	7.25E-05
Acrolein	7.88E-06	2.46E-04	3.39E-02	7.88E-06	4.53E-02	2.27E-05
Naphthalene	1.30E-04	1.43E-04	1.97E-02	1.30E-04	7.48E-01	3.74E-04
Acenaphthylene	9.23E-06	--	--	9.23E-06	5.31E-02	2.65E-05
Acenaphthene	4.68E-06	--	--	4.68E-06	2.69E-02	1.35E-05
Fluorene	1.28E-05	--	--	1.28E-05	7.36E-02	3.68E-05
Phenanthrene	4.08E-05	--	--	4.08E-05	2.35E-01	1.17E-04
Anthracene	1.23E-06	--	--	1.23E-06	7.07E-03	3.54E-06
Fluoranthene	4.03E-06	--	--	4.03E-06	2.32E-02	1.16E-05
Pyrene	3.71E-06	--	--	3.71E-06	2.13E-02	1.07E-05
Benzo(a)anthracene	6.22E-07	--	--	6.22E-07	3.58E-03	1.79E-06
Chrysene	1.53E-06	--	--	1.53E-06	8.80E-03	4.40E-06
Benzo(b)fluoranthene	1.11E-06	--	--	1.11E-06	6.38E-03	3.19E-06
Benzo(k)fluoranthene	2.18E-07	--	--	2.18E-07	1.25E-03	6.27E-07
Benzo(a)pyrene	2.57E-07	--	--	2.57E-07	1.48E-03	7.39E-07
Indeno(1,2,3-cd)pyrene	4.14E-07	--	--	4.14E-07	2.38E-03	1.19E-06
Dibenz(a,h)anthracene	3.46E-07	--	--	3.46E-07	1.99E-03	9.95E-07
Benzo(g,h,i)perylene	5.56E-07	--	--	5.56E-07	3.20E-03	1.60E-06
TOTAL PAH	2.12E-04	4.05E-04	5.59E-02	2.12E-04	1.22E+00	6.10E-04
Cadmium	--	1.09E-05	1.50E-03	1.09E-05	6.25E-02	3.13E-05
Hexavalent Chromium	--	7.25E-07	1.00E-04	7.25E-07	4.17E-03	2.08E-06
Arsenic	--	1.16E-05	1.60E-03	1.16E-05	6.67E-02	3.33E-05
Lead	--	6.01E-05	8.30E-03	6.01E-05	3.46E-01	1.73E-04
Nickel	--	2.83E-05	3.90E-03	2.83E-05	1.63E-01	8.13E-05
Ammonia f	--	5.80E-03	8.00E-01	5.80E-03	3.33E+01	1.67E-02
Copper	--	2.97E-05	4.10E-03	2.97E-05	1.71E-01	8.54E-05
Ethylbenzene	--	7.90E-05	1.09E-02	7.90E-05	4.54E-01	2.27E-04
Hexane	--	1.95E-04	2.69E-02	1.95E-04	1.12E+00	5.60E-04
Hydrogen Chloride	--	1.35E-03	1.86E-01	1.35E-03	7.76E+00	3.88E-03
Manganese	--	2.25E-05	3.10E-03	2.25E-05	1.29E-01	6.46E-05
Mercury	--	1.45E-05	2.00E-03	1.45E-05	8.33E-02	4.17E-05
Selenium	--	1.59E-05	2.20E-03	1.59E-05	9.17E-02	4.58E-05
				Total	**63.12**	**3.16E-02**

[a] Emission factors from AP-42 Chapter 3, Table 3.4-3 and 3.4-4.

[b] Emission factors converted from lb/1000 gallons to lb/MMBtu using the 40 CFR 98.33 default HHV of 0.138 MMBtu/Gal.

[c] Emission factors from South Coast Air Quality Management District Supplemental Instructions for Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory, Table B-2 for Stationary and Portable Internal Combustion Engines (http://www.aqmd.gov/docs/default-source/planning/annual-emission-reporting/supplemental-instructions-for-ab2588-facilities.pdf?sfvrsn=12).

[d] Proposed emission factors reflect the minimum emission factor between AP-42 and SCAQMD.

TABLE A-3

3,250-kW Standby Generator

Paste Plant Notice of Intent Application

Source Type	Annual Hours of Operation	Quanitity	Rating (hp)	Rating (kW)	Fuel Use (gal/hr)	PM_{10} Emissions (tpy)	$PM_{2.5}$ Emissions (tpy)	SO_X Emissions (tpy)	NO_X Emissions (tpy)	VOC Emissions (tpy)	CO Emissions (tpy)	Total HAP Emissions (tpy)
Paste Plant Standby Generators	100	1	4357	3250	219.8	0.01	0.01	2.64E-03	0.24	0.07	1.25	1.66E-02

Note:
Engines are EPA Tier 4.

GHG Emissions Calculations

Source	Annual Hours of Operation	Fuel Use (gal/hr)	CO_2 Emissions (tpy)	CH_4 Emissions (tpy)	N_2O Emissions (tpy)	CO_2e Emissions (tpy)
Paste Plant Standby Generators	100	219.8	247.29	1.00E-02	2.01E-03	248.14

Notes:

Conversion	0.746	kw/hp
Grams to lb conversion	0.002204624	lb/gram

Fuel consumption taken from manufacturer's specifications, assuming standby at 60 Hz, 100% load (pg 2, spec).
Emissions taken from rated speed nominal data versus site variation data.
Assume PM_{10}=$PM_{2.5}$

Pollutant	Emission Factor	Units	Source
PM_{10}	0.022	g/bhp-hr	DieselNet Tier 4 specs for gensets >2015, >560kW
$PM_{2.5}$	0.022	g/bhp-hr	DieselNet Tier 4 specs for gensets >2015, >560kW
SO_x	0.000012135	lb/hp-hr	AP-42 Chapter 3 Table 3.4-1
NO_x	0.5	g/bhp-hr	DieselNet Tier 4 specs for gensets >2015, >560kW
VOC	0.14	g/bhp-hr	DieselNet Tier 4 specs for gensets >2015, >560kW
CO	2.6	g/bhp-hr	DieselNet Tier 4 specs for gensets >2015, >560kW
CO_2	73.96	kg/MMBtu	40 CFR 98.33 Table C-1
CH_4	0.003	kg/MMBtu	40 CFR 98.33 Table C-2
N_2O	0.0006	kg/MMBtu	40 CFR 98.33 Table C-2
Diesel heat rating	0.138	MMBtu/gal	40 CFR 98.33 Table C-1
Conversion	1.1023	ton/tonne	
Sulfur content of diesel	0.0015	percent	

GHG emissions are calculated using 40 CFR 98.33 Equation C-2a and C-9a.
DieselNet standards can be found at: https://dieselnet.com/standards/us/nonroad.php#tier4.

TABLE A-3

3,250-kW Standby Generator

Paste Plant Notice of Intent Application

HAP Emissions

Pollutant	AP-42 Emission Factor (lb/MMBtu)[a]	SCAQMD Emission Factor (lb/MMBtu)[b]	SCAQMD Emission Factor (lb/1000 gal)[c]	Proposed Emission Factor (lb/MMBtu)[d]	Emissions (lbs/yr)	Emissions (tons/yr)
Benzene	7.76E-04	1.35E-03	1.86E-01	7.76E-04	2.35E+00	1.18E-03
Toluene	2.81E-04	7.64E-04	1.05E-01	2.81E-04	8.52E-01	4.26E-04
Xylenes	1.93E-04	3.07E-04	4.24E-02	1.93E-04	5.85E-01	2.93E-04
1,3-Butadiene	--	1.58E-03	2.17E-01	1.58E-03	4.78E+00	2.39E-03
Formaldehyde	7.89E-05	1.25E-02	1.73E+00	7.89E-05	2.39E-01	1.20E-04
Acetaldehyde	2.52E-05	5.68E-03	7.83E-01	2.52E-05	7.64E-02	3.82E-05
Acrolein	7.88E-06	2.46E-04	3.39E-02	7.88E-06	2.39E-02	1.20E-05
Naphthalene	1.30E-04	1.43E-04	1.97E-02	1.30E-04	3.94E-01	1.97E-04
Acenaphthylene	9.23E-06	--	--	9.23E-06	2.80E-02	1.40E-05
Acenaphthene	4.68E-06	--	--	4.68E-06	1.42E-02	7.10E-06
Fluorene	1.28E-05	--	--	1.28E-05	3.88E-02	1.94E-05
Phenanthrene	4.08E-05	--	--	4.08E-05	1.24E-01	6.19E-05
Anthracene	1.23E-06	--	--	1.23E-06	3.73E-03	1.87E-06
Fluoranthene	4.03E-06	--	--	4.03E-06	1.22E-02	6.11E-06
Pyrene	3.71E-06	--	--	3.71E-06	1.13E-02	5.63E-06
Benzo(a)anthracene	6.22E-07	--	--	6.22E-07	1.89E-03	9.43E-07
Chrysene	1.53E-06	--	--	1.53E-06	4.64E-03	2.32E-06
Benzo(b)fluoranthene	1.11E-06	--	--	1.11E-06	3.37E-03	1.68E-06
Benzo(k)fluoranthene	2.18E-07	--	--	2.18E-07	6.61E-04	3.31E-07
Benzo(a)pyrene	2.57E-07	--	--	2.57E-07	7.80E-04	3.90E-07
Indeno(1,2,3-cd)pyrene	4.14E-07	--	--	4.14E-07	1.26E-03	6.28E-07
Dibenz(a,h)anthracene	3.46E-07	--	--	3.46E-07	1.05E-03	5.25E-07
Benzo(g,h,i)perylene	5.56E-07	--	--	5.56E-07	1.69E-03	8.43E-07
TOTAL PAH	2.12E-04	4.05E-04	5.59E-02	2.12E-04	6.43E-01	3.22E-04
Cadmium	--	1.09E-05	1.50E-03	1.09E-05	3.30E-02	1.65E-05
Hexavalent Chromium	--	7.25E-07	1.00E-04	7.25E-07	2.20E-03	1.10E-06
Arsenic	--	1.16E-05	1.60E-03	1.16E-05	3.52E-02	1.76E-05
Lead	--	6.01E-05	8.30E-03	6.01E-05	1.82E-01	9.12E-05
Nickel	--	2.83E-05	3.90E-03	2.83E-05	8.57E-02	4.29E-05
Ammonia f	--	5.80E-03	8.00E-01	5.80E-03	1.76E+01	8.79E-03
Copper	--	2.97E-05	4.10E-03	2.97E-05	9.01E-02	4.51E-05
Ethylbenzene	--	7.90E-05	1.09E-02	7.90E-05	2.40E-01	1.20E-04
Hexane	--	1.95E-04	2.69E-02	1.95E-04	5.91E-01	2.96E-04
Hydrogen Chloride	--	1.35E-03	1.86E-01	1.35E-03	4.09E+00	2.05E-03
Manganese	--	2.25E-05	3.10E-03	2.25E-05	6.81E-02	3.41E-05
Mercury	--	1.45E-05	2.00E-03	1.45E-05	4.40E-02	2.20E-05
Selenium	--	1.59E-05	2.20E-03	1.59E-05	4.84E-02	2.42E-05
				Total	**33.29**	**1.66E-02**

[a] Emission factors from AP-42 Chapter 3, Table 3.4-3 and 3.4-4.

[b] Emission factors converted from lb/1000 gallons to lb/MMBtu using the 40 CFR 98.33 default HHV of 0.138 MMBtu/Gal.

[c] Emission factors from South Coast Air Quality Management District Supplemental Instructions for Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory, Table B-2 for Stationary and Portable Internal Combustion Engines (http://www.aqmd.gov/docs/default-source/planning/annual-emission-reporting/supplemental-instructions-for-ab2588-facilities.pdf?sfvrsn=12).

[d] Proposed emission factors reflect the minimum emission factor between AP-42 and SCAQMD.

TABLE A-4
Storage Silos
Paste Plant Notice of Intent Application

Source Name	Quantity	PM_{10} Emission Factor (gr/scf)	Design Flow Rate (acfm)	Design Flow Rate (scfm)	PM_{10} Emissions (lb/hr)	$PM_{2.5}$ Emissions (lb/hr)	PM_{10} Pit Escape Factor (%)	$PM_{2.5}$ Pit Escape Factor (%)	Controlled PM_{10} Emissions (lb/hr)	Controlled $PM_{2.5}$ Emissions (lb/hr)	Controlled PM_{10} Emissions (tpy)	Controlled $PM_{2.5}$ Emissions (tpy)	Control System and Comments
Storage Silos	2	0.02	1,075	1,059	3.63E-01	1.81E-01	20	21	7.26E-02	3.81E-02	3.18E-01	1.67E-01	Bin vents

Notes:
- Emissions from baghouse dust collector based on information provided by RTK in email correspondence.
- $PM_{2.5}$ emissions are estimated to be 50% of PM_{10} emissions.
- SCFM was converted from ACFM using the below equation and the following assumptions:
  SCFM = ACFM * (14.7+PSIG/14.7) * (520/ 460+T)
  P = PSIG of process, assume to be 0
  T = Actual air temperature in F, assume to be 68F
  Assumes STP, 60F and 14.7 psia
- Annual Hours of Operation 8760

TABLE A-5
Mixer Duster Collector
Paste Plant Notice of Intent Application

Source Name	Quantity	PM_{10} Emission Factor (gr/scf)	Design Flow Rate (acfm)	Design Flow Rate (scfm)	PM_{10} Emissions (lb/hr)	$PM_{2.5}$ Emissions (lb/hr)	PM_{10} Pit Escape Factor (%)	$PM_{2.5}$ Pit Escape Factor (%)	Controlled PM_{10} Emissions (lb/hr)	Controlled $PM_{2.5}$ Emissions (lb/hr)	Controlled PM_{10} Emissions (tpy)	Controlled $PM_{2.5}$ Emissions (tpy)	Control System and Comments
Mixer Dust Collector	1	0.02	400	394	6.75E-02	3.38E-02	20	21	1.35E-02	7.09E-03	0.00E+00	0.00E+00	Baghouse

Notes:
- Emissions from paste mixer dust collector based on information provided by RTK in email correspondence.
- $PM_{2.5}$ emissions are estimated to be 50% of PM_{10} emissions.
- SCFM was converted from ACFM using the below equation and the following assumptions:
  SCFM = ACFM * (14.7+PSIG/14.7) * (520/ 460+T)
  P = PSIG of process, assume to be 0
  T = Actual air temperature in F, assume to be 68F
  Assumes STP, 60F and 14.7 psia
- Annual Hours of Operation: 8760

Attachment B
Modeling Analysis Results

Jacobs

Bingham Canyon Mine Paste Plant Notice of Intent: Air Dispersion Modeling Report

Date:	January 4, 2024
Project name:	Notice of Intent for Bingham Canyon Mine
Attention:	Jenny Esker/RTK
Company:	Rio Tinto Kennecott Utah Copper LLC
Prepared by:	Jacobs

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1. Introduction

Rio Tinto Kennecott Utah Copper LLC (RTK) is submitting a Notice of Intent (NOI) application to modify Bingham Canyon Mine Approval Order (AO) DAQE-AN105710047-21. RTK proposes to add auxiliary equipment to the Paste Plant, specifically four emergency standby generators, two storage silos, and one mixer dust collector to support the underground mining operations (Proposed Project). The storage silos will be equipped with baghouses. Details regarding the process, associated emissions, and best available control technology (BACT) analysis can be found in the NOI application.

Discussions with the Utah Department of Air Quality (UDAQ) on April 11, 2023, indicated an air dispersion modeling analysis is required for particulate matter less than 10 micrometers in diameter (PM_{10}) and nitrogen dioxide (NO_2). This modeling report was prepared in support of the NOI and outlines the methodology and results of the modeling analysis for PM_{10} and NO_2.

2. Project Emissions

The Proposed Project includes emissions from four (4) emergency generators, three (3) with a rated capacity of two (2) megawatts (MW) and one (1) with a rated capacity of 3.25 MW. Each of these generators will be powered by a U.S. Environmental Protection Agency (EPA) Tier 4 certified engine with a rated capacity of approximately 2,721 horsepower (hp) for the 2 MW units and 4,357 hp for the 3.25 MW unit. Each generator has an assumed operation of no more than 100 hours per year for maintenance and testing. Maintenance and testing activities would occur for one unit at any given time. Additionally, the Proposed Project will include mixer dust collector and two new lime storage silos equipped with baghouses to capture and control particulate emissions from the transfer of material. Each silo and the mixer dust collector is assumed to operate 8,760 hours per year.

All proposed sources in the NOI will be located within the Bingham Canyon Mine (BCM) pit and utilize the pit escape fraction for non-combustion-related particulate emissions; this includes emissions from the lime storage silos as outlined in the approval order.

A summary of the controlled emissions associated with the Proposed Project, as presented in the NOI application, is provided in Table 2-1. Additional details regarding the emission estimates can be found in the NOI application.

Table 2-1. Summary of Proposed Project Emissions

Source	Potential Emissions in Tons per Year						
	PM_{10}	$PM_{2.5}$	SO_X	NO_X	VOC	CO	HAP
Standby Generators	3.04E-02	3.04E-02	7.60E-03	6.90E-01	1.93E-01	3.59E+00	4.82E-02
Storage Silos	3.18E-01	1.67E-01	—	—	—	—	—
Mixer Dust Collector	5.92E-02	3.11E-02	—	—	—	—	—
Total Emissions	4.07E-01	2.28E-01	7.60E-03	6.90E-01	1.93E-01	3.59E+00	4.82E-02

Notes:

- = not applicable
CO = carbon monoxide
HAP = hazardous air pollutant
NO_x = nitrogen oxide
$PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter
SO_x = sulfur oxide
VOC = volatile organic compound

3. Air Quality Dispersion Modeling Analysis

Section 3.1 describes the air dispersion modeling methodology. Section 3.2 describes the source characterization.

3.1 Air Dispersion Modeling Methodology

This section presents the methodology employed by Jacobs to conduct the air dispersion modeling.

3.1.1 Meteorological Data

Five years of processed meteorological data were provided by UDAQ for the Herriman Meteorological Station, which is owned and operated by UDAQ and located at 14058 Mirabella Drive in Herriman. The dataset represents the five-year meteorological period from 2016 to 2020. UDAQ indicated this meteorological dataset is most representative for the BCM based on proximity and surrounding geography.

The predominate wind directions for this meteorological dataset are winds blowing from the west--southwest and south. The average wind speed for the 5-year meteorological period (2016-2020) is 3.05 meters per second. A wind rose for this meteorological dataset is depicted in Figure 3-1.

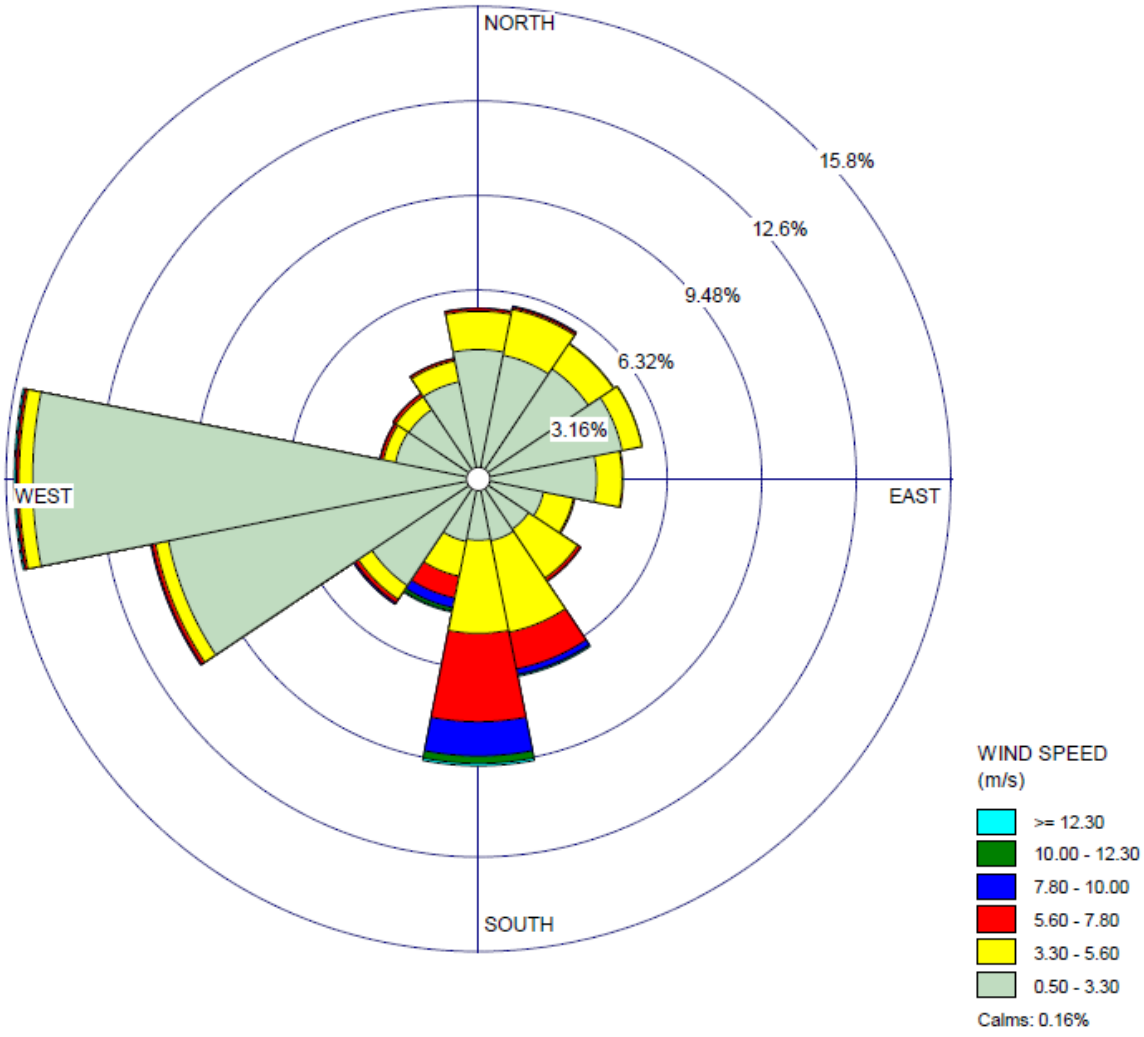

Figure 3-1. UDAQ Herriman Station Meteorological Data Wind Rose, 2016 through 2020

3.1.2 Receptors

The ambient air boundary was defined based on parcel data provided to Jacobs; these data delineate what areas are under RTK ownership or within RTK controlled access areas. Parcels owned by RTK are not considered ambient air and therefore had no receptors placed within them. Other features such as publicly accessible roads and highways that run through RTK-owned parcels were considered ambient air and therefore receptors were placed within the parcels. The selection of receptors in AERMOD for this analysis consisted of nested cartesian grids with the following spacing from the main RTK parcel:

- Discrete receptors every 25 meters around the ambient air boundary
- 25-meter spacing from the ambient air boundary to 100 meters from the grid origin
- 50-meter spacing from beyond 100 meters to 500 meters from the grid origin
- 100-meter spacing from beyond 500 meters to 1,000 meters from the grid origin
- 500-meter spacing from beyond 1,000 meters to 5,000 meters from the grid origin
- 1,000-meter spacing from beyond 5,000 meters to 15,000 meters from the grid origin

The ambient air boundary and receptor grid used in this modeling analysis are shown in Figure 3-2. All receptors are expressed in the Universal Transverse Mercator North American Datum 1983, Zone 12 coordinate system. U.S. Geological Survey National Elevation Dataset terrain data were used in conjunction with the AERMAP preprocessor (Version 18081) to determine receptor elevations and terrain maxima.

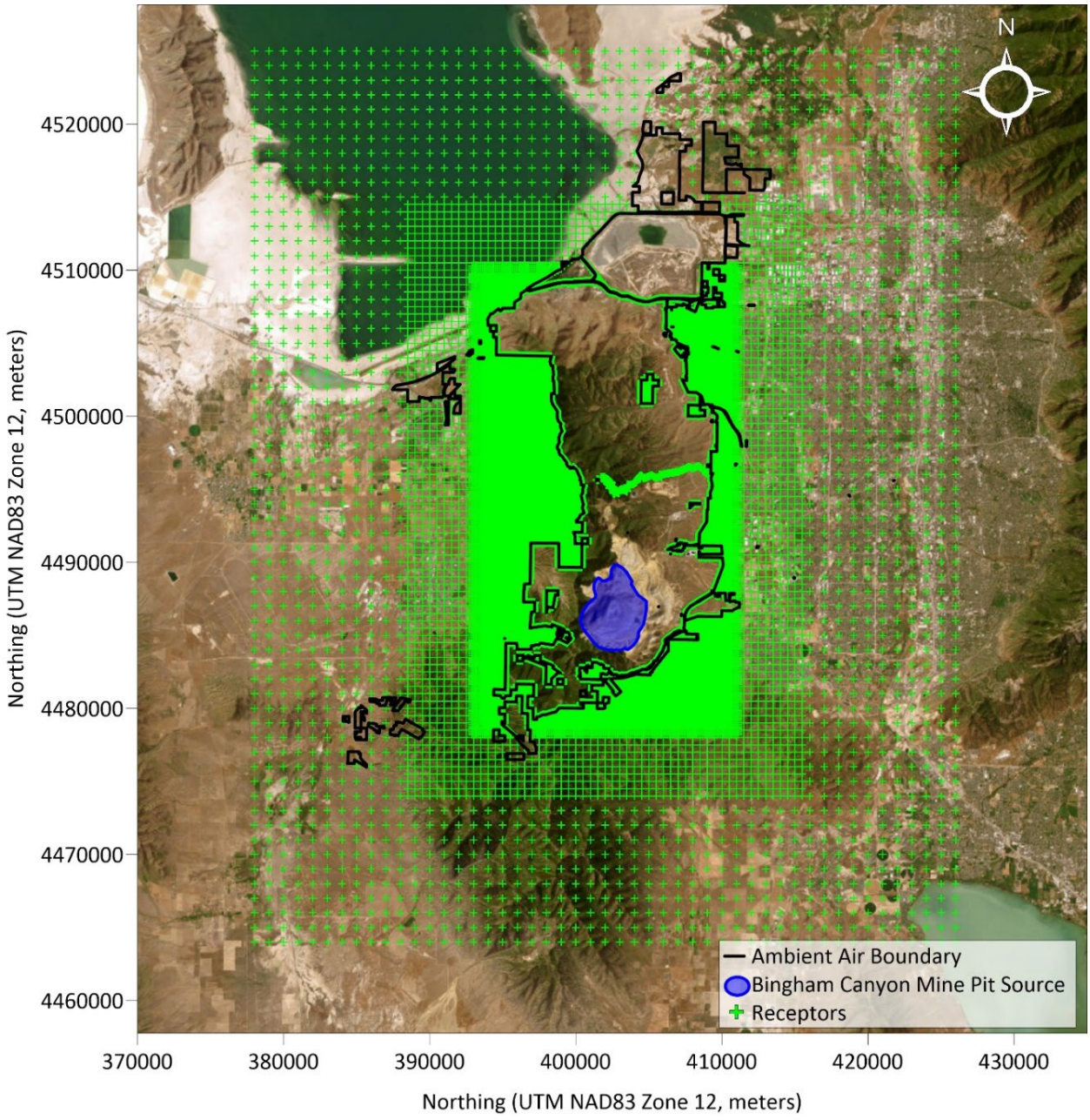

Figure 3-2. Air Dispersion Modeling Analysis Reduced Receptor Grid

3.1.3 Building Downwash

Building downwash effects in AERMOD are applicable to the point source type and take into account stack dimensions, building dimensions, and building elevations. This modeling analysis does not include any point sources; therefore, building downwash effects were not considered.

3.1.4 Nitrogen Dioxide Modeling Procedures

The *Guideline on Air Quality Models*, Appendix W to 40 CFR Part 51 (EPA 2017), recommends a tiered screening approach to characterize the conversion of total NO_X from the proposed source to NO_2. A Tier 1 approach assumes a 100 percent conversion of total NO_x to NO_2. The Tier 2 approach allows for the use of the Ambient Ratio Method- 2 (ARM2). The Tier 1 and Tier 2 options do not require EPA approval.

A Tier 2 approach was applied using ARM2 options in AERMOD to calculate ambient NO_2 concentrations surrounding the site by applying a default NO_2/NO_x equilibrium ratio of 0.90 and an NO_2/NO_x ISR of 0.1 as indicated in discussions with UDAQ.

3.2 Source Characterization

The model layout and source characterization in this modeling analysis were developed based on the data provided for the Proposed Project and the BCM. The model source layout for each of the scenarios is shown on Figure 3-2. The specific source parameters and characterization for each source type are outlined in the following section.

Generator maintenance and testing operations would occur during the hours of 8 AM and 8 PM. As a result, the 1-hour and annual NO_2 modeling utilized the hour of day emission factor within AERMOD to account for these operating hours. Specifically, the 1-hour analysis assumed a single-highest emitting generator, and the annual analysis assumes all generators. The 24-hour PM_{10} analysis conservatively assumes 24 hours of generator operation of the single-highest emitting generator and the storage silos and mixer dust collector.

3.2.1 BCM Pit

The BCM pit is represented as a single AREAPOLY source in the model based on the BCM pit influence boundary (PIB). All emissions from sources within the PIB are modeled through this AREAPOLY source, which represents the top of the BCM pit. The approach of modeling the BCM pit as an AREAPOLY source has been validated using computational fluid dynamics and through historical use in modeling analyses for UDAQ, including State Implementation Plan analyses. The source parameters modeled for this source are shown in Table 3-1.

Table 3-1. BCM Pit Source Parameters

Source ID	Base Elevation (m)[a]	Release Height (m)	Number of Vertices	Initial Vertical Dimension (m)
PIT	2,329	0	89	0

[a] Base elevation was obtained from mine topographical data provided by RTK and processed with AERMAP Version 18081.

Note: m = meter(s)

The BCM pit emissions include all sources specified in the NOI as they are located within the BCM pit. Details of the modeled emission rates are shown in Table 3-2.

Table 3-2. BCM Pit Source Emission Rates

	Max Hourly PM_{10} Emissions (lbs/hr)[a]	Max Hourly NO_2 Emissions (lbs/hr)[b]	Annual NO_2 Emissions (tpy)[c]
	0.297	4.80	0.69

[a] Emission rate represents the maximum hourly emission rate, which includes the 3,250-kW generator as well as both lime storage silos and the mixer dust collector for the PM_{10} analyses.

[b] Emission rate represents the maximum hourly emission rate, which includes one single 3,250-kW standby generator operating at a time for the 1-hour NO_2 analyses.

[c] Emission rate represents the maximum annual emissions, which includes 100 hours per year for one single 3,250-kW standby generator operating at a time.

Notes:

lbs/hr = pound(s) per hour
tpy = ton(s) per year

4. Results

The modeled results from this analysis were compared to the applicable significant impact levels (SILs) shown in Table 4-1. The predicted impacts for the Proposed Project are less than the respective SILs. Therefore, the NO_2 and PM_{10} from the Proposed Project are not significant (that is, less than the SIL) and would not cause or contribute to a violation of the National Ambient Air Quality Standards. Figure 4-1 illustrates the point of maximum impact for each modeled pollutant and averaging period.

Table 4-1. Air Dispersion Modeling Analysis Results

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)	Significant Impact Level ($\mu g/m^3$)	Exceeds SIL?
NO_2	1-Hour[a]	5.90	7.55	No
	Annual[b]	0.00319	1	No
PM_{10}	24-Hour[c]	0.09313	5	No

[a] Modeled concentration represents the maximum daily 1-hour average concentration averaged over the five modeled years (2016-2020).

[b] Modeled concentration represents the maximum annual average concentration during the five modeled years (2016-2020).

[c] Modeled concentration represents the maximum 24-hour average concentration during the five modeled years (2016-2020).

Note: $\mu g/m^3$ = microgram(s) per cubic meter

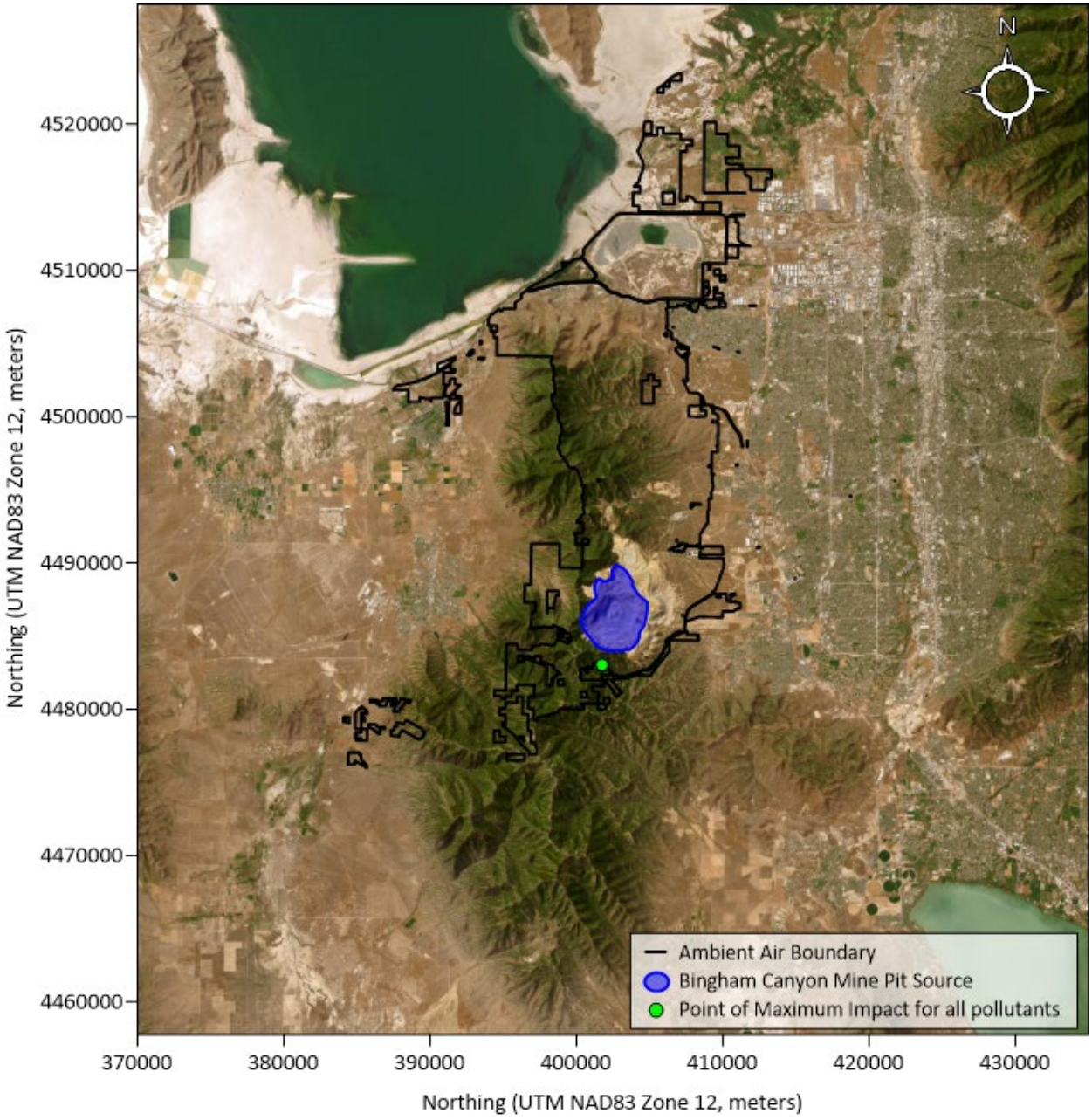

Figure 4-1. Air Dispersion Modeling Analysis Points of Maximum Impact

5. Reference

U.S. Environmental Protection Agency (EPA). 2017. Appendix W of 40 CFR Part 51—Guideline On Air Quality Models (Revised), Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. January.