

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

RN105720043

Jenny Esker Rio Tinto Kennecott Utah Copper LLC 4700 Daybreak Parkway South Jordan, UT 84095 jenny.esker@riotinto.com

Dear Jenny Esker,

October 19, 2022

Re: Engineer Review: Modification to Approval Order DAQE-AN105720040-20 dated February 4, 2020 Project Number: N105720043

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 **Sarah Foran** at (385) 306-6724 if there are questions or concerns with the review of the draft permit conditions. Upon resolution of your concerns, please email sforan@utah.gov the signed cover letter to Sarah Foran. 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 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)

195 North 1950 West • Salt Lake City, UT Mailing Address: P.O. Box 144820 • Salt Lake City, UT 84114-4820 Telephone (801) 536-4009 • T.D.D. (801) 903-3978 www.deq.utah.gov Printed on 100% recycled paper

UTAH DIVISION OF AIR QUALITY ENGINEER REVIEW

SOURCE INFORMATION

Project Number Owner Name Mailing Address

Source Name Source Location

UTM Projection UTM Datum UTM Zone SIC Code

Source Contact Phone Number Email

Project Engineer Phone Number Email

Notice of Intent (NOI) Submitted Date of Accepted Application N105720043 Rio Tinto Kennecott Utah Copper LLC 4700 Daybreak Parkway South Jordan, UT, 84095

Rio Tinto Kennecott Utah Copper LLC- Central Laboratory 9800 West 2100 South Magna, UT 84044

403,817 m Easting, 4,507,843 m Northing NAD83 UTM Zone 12 1021 (Copper Ores)

Jenny Esker (801) 569-6494 jenny.esker@riotinto.com

Sarah Foran, Engineer (385) 306-6724 sforan@utah.gov

February 24, 2022 July 5, 2022

SOURCE DESCRIPTION

General Description

Rio Tinto Kennecott Utah Copper (RTKC) operates the Central Laboratory (Central Lab), which is located approximately 1 mile east of the RTKC Refinery. The Central Lab performs analysis for metallurgical process optimization and environmental and safety compliance. Samples evaluated include metallic chips, ore and concentrate solids, and liquids. The analyses performed include x-ray fluorescence of pulverized samples, mineral acid solutions with dissolved solid concentrates analyzed by various techniques, and fire assay techniques for determination of precious metals. Environmental and safety analysis follow EPA and National Institute for Occupational Health (NIOSH) procedures. The facility operates intermittently to meet RTKC's needs. Particulate emissions are controlled with filters and baghouses. Acid fumes are controlled with a caustic scrubber.

<u>NSR Classification:</u> Minor Modification at Minor Source

Source Classification Located in , Northern Wasatch Front O3 NAA, Salt Lake City UT PM_{2.5} NAA, Salt Lake County SO₂ NAA, Salt Lake County Airs Source Size: B

Applicable Federal Standards

Project Proposal Modification to Approval Order DAQE-AN105720040-20 dated February 4, 2020

Project Description

RTKC has requested a modification to add a Sample preparation baghouse. The baghouse will control emissions from material handling inside the lab. An estimated 10,000 lbs per year of material will move through the central laboratory in the operation. With the baghouse this will result in an additional 0.003 tons/year of PM_{10} and 0.001 tons/yr of $PM_{2.5}$.

EMISSION IMPACT ANALYSIS

Criteria pollutants and HAPs emission increases are below their respective thresholds in R307-410-4 and R307-410-5. No modeling analysis is required. [Last updated July 5, 2022]

SUMMARY OF EMISSIONS

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

Change (TPY)	Total (TPY)
0	5559.00
0	3.94
0	2.88
0	0.53
0	0.39
0	0.03
0	0.26
	Change (TPY) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Hazardous Air Pollutant	Change (lbs/yr)	Total (lbs/yr)
Generic HAPs (CAS #GHAPS)	0	80
	Change (TPY)	Total (TPY)
Total HAPs	0	0.04

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 Sample Preparation Baghouse

The baghouse will route emissions currently venting indoors to venting outdoors. The total PM_{10} and $PM_{2.5}$ emissions are 0.003 tons/yr and 0.001 tons/yr respectively. The baghouse will have a control efficiency of 99% and maintain visible emissions at or below 10% opacity (II.B.1.a). This is BACT for the new baghouse. [Last updated October 13, 2022]

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	All definitions, terms, abbreviations, and references used in this AO conform to those used in the UAC R307 and 40 CFR. Unless noted otherwise, references cited in these AO conditions refer to those rules. [R307-101]
I.2	The limits set forth in this AO shall not be exceeded without prior approval. [R307-401]
I.3	Modifications to the equipment or processes approved by this AO that could affect the emissions covered by this AO must be reviewed and approved. [R307-401-1]
I.4	All records referenced in this AO or in other applicable rules, which are required to be kept by the owner/operator, shall be made available to the Director or Director's representative upon request, and the records shall include the five-year period prior to the date of the request. Unless otherwise specified in this AO or in other applicable state and federal rules, records shall be kept for a minimum of five (5) years. [R307-401-8]
I.5	At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this AO, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Director which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded. [R307-401-4]
I.6	The owner/operator shall comply with UAC R307-107. General Requirements: Breakdowns. [R307-107]
I.7	The owner/operator shall comply with UAC R307-150 Series. Emission Inventories. [R307-150]

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 APPROVEI) EQUIPMENT
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I.8

II.A.1	RTKC - Central Laboratory	
II.A.2	Horizontal Flume Scrubber Controls acid fumes from the wet digestion/preparation process	
II.A.3	Process Laboratory Dust Collector Controls fire assay furnaces	
II.A.4	Environmental Laboratory Dust Collector Controls sample prep equipment	
II.A.5	Muffle Furnace Filter Controls small electric furnace used to ash 37 mm diameter industrial hygiene filters	
II.A.6	Fire Assay Fume Hood Filter Controls fire assay furnaces (formerly flux mixers filters)	
II.A.7	Ore Compactor Filter Controls ore compactor (spectroscopy)	
II.A.8	Ore Compactor Filter Controls ore compactor	
II.A.9	Hot Water Boiler Rating: 7.1 MMBtu/hr Fuel: Natural gas	
II.A.10	Space Heaters Various space heaters each rated less than 5 MMBtu/hr. Listed for informational purposes only.	
II.A.11	Fire Assay Lab Baghouse Controls fusion and cupellation furnaces	

II.A.12	Two Fusion Furnaces Rating: 511,819 BTU/hr each Fuel: Natural gas
II.A.13	Cupellation Furnace Rating: 255,901 Btu/hr Fuel: Natural gas
II.A.14 NEW	One Sample Preparation Baghouse (NEW) Control efficiency: 99% (0.009 grains/dscf)

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 <u>REQUIREMENTS AND LIMITATIONS</u>

II.B.4	Baghouse Requirements		
NEW			
II.B.4.a	The owner/operator shall control emissions from the sample preparation area with a baghout	ise.	
NFW	[R 307-401-8]		
112.0			
IID 4 h	The average of a sector shall install a more smaller or make the list measure source to measure the		
11.D.4.0	The owner/operator shart instant a manometer of magnetience pressure gauge to measure the		
NEW	differential pressure across the bagnouse. The bagnouse shall operate within the static press	sure	
	range recommended by the manufacturer for normal operations. [R30/-401-8]		
II.B.4.c	Pressure drop readings shall be recorded at least once during each week of operation while the		
NEW	baghouse is operating. Records documenting the pressure drop shall be kept in a log and shall		
	include the following:		Commented [DS3(1]: Can Kennecott get clarification that these
			new baghouse requirements are for the new baghouse only?
	A. Unit identification;		The Semula Depresentian backeyes is a batch message backeyes and
	,		not a continuous running baghouse which will make doing weekly
	B. Manufacturer recommended pressure drop for the unit:		dP reading hard to capture. Is this requirement necessary?
	C Weekly pressure drop readings:		
	e. Weekly pressure arop readings;		
	D Date of reading		
	D. Date of reading		
	[D 207 401 8]		
HD 4 1			
II.B.4.d	Each pressure gauge shall be located such that an inspector/operator can safely read the		
NEW	indicator at any time. [R307-401-8]		
IIB1	Sitewide Requirements		

II.B.1.a	Visible emissions from any point or fugitive emission source associated with the installation of the source or with the control facilities shall not exceed 10% opacity. [R307-401-8]
II.B.1.a.1	Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9. [R307-401-8]
II.B.2	Scrubber Requirements
II.B.2.a	The owner/operator shall install, calibrate, maintain, and operate a monitoring device for the continuous measurement of the pressure drop in the gas stream through the scrubber. The monitoring device must be certified by the manufacturer. The monitoring device shall be accurate within plus or minus one inch of water gauge and must be calibrated on an annual basis according to the manufacturer's instructions. Continuous recording for the monitoring device is not required. However, weekly records of readings shall be maintained. [R307-401-8]
II.B.3	Boiler Requirements
II.B.3.a	The owner/operator shall only use natural gas as a fuel in the boiler. [R307-401-8]

PERMIT HISTORY

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

SupersedesDAQE-AN105720040-20 dated February 4, 2020Is Derived FromNOI dated February 24, 2022IncorporatesAdditional Information dated April 22, 2022IncorporatesAdditional Information dated September 6, 2019

REVIEWER COMMENTS

1. Comment regarding Emission Estimates:

 PM_{10} Emissions from the sample preparation baghouse were estimated using and engineering estimate of 5% airborne materials. The percentage was determined to be more conservative than the AP-42 mineral processing emission factor which assumed 0.00005 lbs/ ton. The facility will process 10,000 lbs of material per-year and the baghouse will have a control efficiency of 99%. This will result in an additional 0.0003 tons/year of PM_{10} . and a design flow rate of 932 dscf/min. $PM_{2.5}$ emissions were based on AP-42 Table B.2.2, Category 3 - Mechanically Generated Aggregate, Unprocessed Ores.

[Last updated September 29, 2022]

ACRONYMS

The following li	ists commonly used acronyms and associated translations as they apply to this
10.000	document:
40 CFR	1 itle 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 ₂ e	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

April 17, 2023

RN105720043

Jenny Esker Rio Tinto Kennecott Utah Copper LLC 4700 Daybreak Parkway South Jordan, UT 84095 jenny.esker@riotinto.com

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> Kimberly D. Shelley Executive Director

DIVISION OF AIR QUALITY Bryce C. Bird

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Approval Signature _____

(Signature & Date)

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SOURCE INFORMATION

Project Number Owner Name Mailing Address

Source Name Source Location

UTM Projection UTM Datum UTM Zone SIC Code

Source Contact Phone Number Email

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403,817 m Easting, 4,507,843 m Northing NAD83 UTM Zone 12 1021 (Copper Ores)

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February 24, 2022 July 5, 2022

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EMISSION IMPACT ANALYSIS

Criteria pollutants and HAPs emission increases are below their respective thresholds in R307-410-4 and R307-410-5. No modeling analysis is required. [Last updated July 5, 2022]

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	0	5559.00
Carbon Monoxide	0	3.94
Nitrogen Oxides	0	2.88
Particulate Matter - PM ₁₀	0	0.53
Particulate Matter - PM _{2.5}	0	0.39
Sulfur Dioxide	0	0.03
Volatile Organic Compounds	0	0.26

Hazardous Air Pollutant		Change (lbs/yr)	Total (lbs/yr)
Generic HAPs (CAS #GHAPS)		0	80
		Change (TPY)	Total (TPY)
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Note: Change in emissions indicates the difference between previous AO and proposed modification.

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1. **BACT review regarding Sample Preparation Baghouse**

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I.6	The owner/operator shall comply with UAC R307-107. General Requirements: Breakdowns. [R307-107]
I.7	The owner/operator shall comply with UAC R307-150 Series. Emission Inventories. [R307-150]

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
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	send the documentation to the Director, attn.: NSR Section. [R307-401-18]

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II.A <u>THE APPROVED EQUIPMENT</u>

II.A.1	RTKC - Central Laboratory
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II.A.8	Ore Compactor Filter Controls ore compactor
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II.A.10	Space Heaters Various space heaters each rated less than 5 MMBtu/hr. Listed for informational purposes only.
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II.B <u>REQUIREMENTS AND LIMITATIONS</u>

ILB 1	Sitewide Requirements
II.B.1.a	Visible emissions from any point or fugitive emission source associated with the installation of the source or with the control facilities shall not exceed 10% opacity. [R307-401-8]
II.B.1.a.1	Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9. [R307-401-8]
II.B.2	Scrubber Requirements
II.B.2.a	The owner/operator shall install, calibrate, maintain, and operate a monitoring device for the continuous measurement of the pressure drop in the gas stream through the scrubber. The monitoring device must be certified by the manufacturer. The monitoring device shall be accurate within plus or minus one inch of water gauge and must be calibrated on an annual basis according to the manufacturer's instructions. Continuous recording for the monitoring device is not required. However, weekly records of readings shall be maintained. [R307-401-8]
II.B.3	Boiler Requirements
II.B.3.a	The owner/operator shall only use natural gas as a fuel in the boiler. [R307-401-8]
II.B.4 NEW	Baghouse Requirements
II.B.4.a NEW	The owner/operator shall control emissions from the sample preparation area with a baghouse. [R307-401-8]
II.B.4.b NEW	The owner/operator shall install a manometer or magnehelic pressure gauge to measure the differential pressure across the baghouse listed in II.A.14. The baghouse shall operate within the static pressure range recommended by the manufacturer for normal operations. [R307-401-8]

II.B.4.c NEW	 Pressure drop readings shall be recorded at least once during each week of operation while the baghouse is operating. Records documenting the pressure drop shall be kept in a log and shall include the following: A. Unit identification; B. Manufacturer recommended pressure drop for the unit (if applicable); C. Weekly pressure drop readings; D. Date of reading. [R307-401-8]
II.B.4.d NEW	Each pressure gauge shall be located such that an inspector/operator can safely read the indicator at any time. [R307-401-8]

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[Last updated September 29, 2022]

ACRONYMS

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

	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 ₂ e	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



Central Lab ER

Daly, Sean 3 (RTKC) <Sean.Daly3@riotinto.com> To: Sarah Foran <sforan@utah.gov> Mon, Feb 20, 2023 at 7:14 PM

Hi Sarah, I know you have been busy with the ozone SIP but was wondering if you have any update on the lab AO?

-Sean

[Quoted text hidden]

RN105720043_with Comments.rtf



Sarah Foran <sforan@utah.gov>

Rio Tinto Kennecott Central Lab NOI

Daly, Sean 3 (RTKC) <Sean.Daly3@riotinto.com> To: Sarah Foran <sforan@utah.gov> Fri, Sep 9, 2022 at 1:43 PM

Hey Sarah,

No information exists documenting why that was chosen because we believe that at the time in 1994/1995, AP-42 was not fully available as a resource. We do believe that is it a conservative assumption. For example, current AP-42 mineral processing emission factors assume that 0.00005 lbs of emissions come from 1 ton of material. The Central Lab assumption is assuming that 0.005 lbs emissions/lbs of material (with baghouse control) which converts to 10 lbs of emissions per ton of material.

Again – this was assumption made in the 1990s and we have worked to keep to the same methodology. We believe it is conversative estimation of the central lab PM10 PTEs for sample processing.

[Quoted text hidden]

TABLE A-1Potential to Emit SummaryCentral Laboratory Sample Preparation Building NOI

	Current PTEs	Add: Sample Prep Building	Proposed PTEs
NO _X Emissions (tpy)	2.88	-	2.88
CO Emissions (tpy)	3.94	-	3.94
PM ₁₀ Emissions (tpy)	0.53	0.003	0.53
PM _{2.5} Emissions (tpy)	0.39	0.001	0.39
SO ₂ Emissions (tpy)	0.03	-	0.03
VOC Emissions (tpy)	0.26	-	0.26
CO ₂ e Emissions (tpy)	5559	-	5559
НАР	0.04	-	0.04

Notes:

- = Pollutant not emitted by the source

tpy = tons per year

TABLE A-1 Sample Preparation Building Emissions

Source Name	Quantity	Handling (lbs)	% Airborne	Efficiency	PM ₁₀	PM ₁₀	PM _{2.5}	Control System
Sample Preparation Building	1	10000	5%	99%	5.00	0.003	0.001	Emissions Controlled with a Baghouse
						0.003	0.001	

NOTES:

- Emission source is not continually operating, rather operates in batches

- 10,000 pounds of samples prepared per year; 5% of samples become airborne, airborne particles filtered by baghouse with 99% control efficiency.

- Emissions for PM2.5 based on factors from AP-42, Table B.2.2, Category 3 - Mechanically Generated Aggregate, Unprocessed Ores.



Rio Tinto Kennecott 4700 Daybreak Parkway South Jordan, Utah 84009

February 24, 2022

Mr. Bryce Bird Department of Environmental Quality Division of Air Quality P.O. Box 144820 Salt Lake City, Utah 84114-4820

Subject: Kennecott Utah Copper Central Laboratory DAQE-AN105720041-21 Notice of Intent Application

Dear Mr. Bird,

Rio Tinto Kennecott Utah Copper (Kennecott) is submitting this Notice of Intent (NOI) application to modify Approval Order (AO) DAQE-AN105720041-21, is sued on August 2, 2021. Previously, Kennecott had permitted a sample preparation building with a baghouse in 2019. However, the project was cancelled and the baghouse was removed from the AO in 2021. At this time, Kennecott is again proposing to add back the sample preparation building baghouse at the Central Lab.

Background

The Central Lab performs analysis for metallurgical process optimization and environmental and safety compliance. Process samples include metallic chips, ore and concentrate solids, and liquids. Process an alysis includes x-ray fluorescence of pulverized samples, mineral acid solutions with dissolved solid concentrates analyzed by various techniques, and fire assay techniques for determination of precious metals. Environmental and Safety analysis follows Environmental Protection Agency (EPA) and National Institute for Occupational Health (NIOSH) procedures. Processes at the Central Lab are operated intermittently to meet RTKC's needs. Particulate emissions from the Central Lab operations are controlled with filters or baghouses and acid fumes are controlled via a caustic scrubber. Permitted sources at the Central Lab include the below:

- Process Lab Dust Collector (Fire Assay Furnaces)
- Environmental Lab Dust Collector (Sample Prep Equipment)
- Muffle Furnace Filter
- Fire Assay Fume Hood Filter (Formerly Flux Mixers)
- Fire Assay Lab Baghouse
- Two (2) Fusion furnaces (511,819 Btu/hr each)
- Cupellation Furnace (255,901 Btu/hr)
- Two (2) Ore Compactors (One for spectroscopy, one is newer)
- Horizontal Fume Scrubber
- Hot Water Boiler (7.1 MMBtu/hr)
- Miscellaneous sources such as space and comfort heating heaters

Emissions Information

The proposed source will result in a small net increase in particulate emissions from dusts created when preparing samples for assay at the Central Lab. Within the proposed sample preparation building, sample preparation equipment is capable of processing 10,000 pounds of sample material each year. For emission estimates, it is assumed that up to five percent of the material may contribute to emissions based on a material balance of the existing process. Particulate emissions from the equipment within the building will be controlled with a baghouse rated with at least 99% control efficiency. Emissions are estimated based on expected operation of the process as these units are not operated continuously and are not always generating dust. The calculation methodology is consistent with that currently used for emissions from the Central Lab.

Potential annual emissions from the proposed source is provided in Table 1.

Source	PM ₁₀ Emissions (lbs/yr)	PM ₁₀ Emissions (tpy)	PM _{2.5} Emissions (tpy)	Emission Control
Sample Preparation Building	5	0.003	0.001	Emissions Controlled with a Baghouse
Total	5.0	0.003	0.001	

Notes:

lbs/yr = pounds per year

 $PM_{10} = particulate matter with aerodynamic diameter equal to or less than 10 microns.$

PM_{2.5} = particulate matter with aerodynamic diameter equal to or less than 2.5 microns.

tpy = tons per year

As can be seen from Table 1, potential emissions from the proposed source are nominal at only 5 pounds per year of PM_{10} , of which approximately 1.5 pounds are $PM_{2.5}$. Updated annual potential to emit values for the Central Lab are provided in Table 2. A detailed estimation of emissions is provided electronically in Attachment 1.

Pollutant	Current PTEs ¹	Sample Prep Building	Proposed PTEs
NO _x Emissions (tpy)	2.88	-	2.88
CO Emissions (tpy)	3.94	-	3.94
PM ₁₀ Emissions (tpy)	0.53	0.003	0.53
PM _{2.5} Emissions (tpy)	0.39	0.001	0.39
SO ₂ Emissions (tpy)	0.03	-	0.03
VOC Emissions (tpy)	0.26	-	0.26
CO ₂ e Emissions (tpy)	5559	-	5559
HAP Emissions (tpy)	0.04	-	0.04

Notes:

¹ Existing PTEs from DAQE-AN 105720041-21.

CO = carbon monoxide

 $CO_2e = carbon \ dioxide \ equivalents$

HAP = hazardous air pollutant

NOx = oxides of nitrogen

PTE = potential to emit

 $SO_2 = sulphur dioxide$ VOC = volatile organic compound RioTinto

Best Available Control Technology Analysis

As required by Utah Administrative Code (UAC) R307-401-6, the Director will issue an AO if determined through plan review that the following conditions have 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 UACR307. Utah has adopted the emissions control BACT process described in 40 CFR 52.21(j) and incorporated by reference into UACR307-405-11. In addition to these five steps, UDAQ guidance requires sources to consider the energy impacts, environmental impacts, and incremental cost of each feasible control technology.

Sample Preparation BACT Analysis

Particulate matter is the only pollutant emitted by the proposed source. Particulates are generated during sample preparation process. These particulates are captured in the process hood and directed through a baghouse and emitted on the outside the building. The annual throughput of sample material is 10,000 pounds and estimated annual emissions are five pounds per year.

- Step 1 Identify Control Technologies. Technologies effective at controlling particulate matter include fabric filtration, a wet scrubber, and ESP.
- Step 2 Eliminate Technically Infeasible Options. All technologies are technically feasible.
- Step 3 Rank Remaining Control Technologies by Control Effectiveness. A desktop review of the RBLC and vendor guarantees was performed for each technology and the most effective technology is fabric filtration, followed by a wet scrubber, and lastly an electrostatic precipitator. Emission rates and control effectiveness for each are provided in Table 3.

Technology	Emission Rate	Control Effectiveness	Source
Fabric Filters	0.009 grains/dscf	99%	RBLC ID AK0084
ESP	Varies	99%	EPA Fact Sheet ^a
Wet Scrubber	0.018 grains/dscf	95%	RBLC ID LA0328

Table 3. Sample Preparation Control Effectiveness

Notes:

Dscf = dry standard cubic feet

 $^{a}\ https://www.epa.gov/air-emissions-monitoring-knowledge-base/monitoring-control-technique-electrostatic-precipitators$

- Step 4 Evaluate Most Effective Controls and Document Results. As can be seen from Table 3, fabric filters and an ESP provide the highest control efficiency. An evaluation of each control technologies' energy, environmental, and economic impacts is required to differentiate between the two technologies.
- **Energy Impacts**. A blower is required to pull particulate laden air from the sample preparation area, through the fabric filter and to the outside of the building. The fan will be used as needed and will not significantly add to energy consumption. Energy impacts of the filter technology is minimal in this application. An ESP requires considerably more power consumption because of the design of the control. ESPs use a corona generated by high voltage direct current to charge particles in an emission stream and get them to adhere to charged collection plates. Energy impacts of an ESP are an order of magnitude higher than a fabric filter.
- **Environmental Impacts**. Both technologies generate particulate waste that must be disposed. No other environmental impacts are anticipated from either technology. Environmental impacts are considered negligible.



- Economic Impacts. Both remaining technologies have equal control effectiveness with fabric filters having less energy impacts than an ESP. Therefore, fabric filters are the most preferred technology for this application and an economic impacts analysis including incremental costs is not required if this technology is proposed for BACT.
- Step 5 Select BACT. Kennecott selects a fabric filter (a baghouse) with at least 99% control effectiveness as BACT. A similar metallurgical as say lab was permitted June 30, 2017 (RBLC ID AK-0084) and 99% control efficiency fabric filters were installed as BACT level controls. Kennecott is proposing the same control technology and efficiency as BACT for this project.

Kennecott 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) 204-2563.

Yours sincerely

Sean Daly Senior Environmental Advisor