AIR SCIENCES INC.

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Grassy Mountain Mine Standard Air Contaminant Discharge Permit Application

PREPARED FOR:
CALICO RESOURCES USA CORP.

PROJECT NO. 343-1
AUGUST 1, 2022

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1.0 APPLICATION FORMS

The Oregon Department of Environmental Quality application forms are provided here for the Standard Air Contaminant Discharge Permit (ACDP) application for the Calico Resources USA Corp. Grassy Mountain Mine project.

1.1 AQ101, AQ501, AQ102 Forms

The following forms provide administrative information for the project, including location, process flows, emission points, and fee calculations.

Save Print

State of Oregon
DEQ Department of Environmental Quality

Form AQ101 - Answer Sheet

DEQ USE ONLY	
Permit Number:	Type of Application:
Application No:	**RNW____MOD_____ NEW ____**
Date Received :	
Regional Office:	**Check No.** **Amount $**

1. Company

Legal Name: Calico Resources USA Corp.

Mailing Address: 665 Anderson Street

City:	State:	Zip Code:
Winnemuca	NV	89445

Number of employees (Corporate): 5

2. Facility Location

Name: Grassy Mountain Mine

Street Address: T21S, R44E

City:	County:	Zip Code:
Malheur County		

Number of employees (Facility): TBD

3. Industrial Classification Code(s)

Primary SIC and NAICS: 1041 10410103

Secondary SIC and NAICS: 10410202

4. Other DEQ Permits

N/A

5. LUCS:

☑ New facility ☐ Modified facility

Tax Lot #:

6. Permit Action:

____ Short Term Activity ACDP
____ New Simple ACDP with short-term NAAQS analysis
____ New Construction ACDP with short-term NAAQS analysis
____ New Standard ACDP with short-term NAAQS analysis
✔ New or modified Standard ACDP (PSD/NSR) with short-term NAAQS analysis
____ Renewal of an existing permit without changes (include form AQ403 for Standard ACDPs)
____ Renewal of an existing permit with changes (include any other necessary forms and form AQ403 for Standard ACDPs)
____ Modification of existing permit

7. Signature

I hereby apply for permission to discharge air contaminants in the State of Oregon, as stated or described in this application, and certify that the information contained in this application and the schedules and exhibits appended hereto, are true and correct to the best of my knowledge and belief.

Glen van Treek	President
Name of official (Printed or Typed)	Title of official and phone number
Signature of official	July 26, 2022 Date

Fee Information
(Make check payable to DEQ)

Note: The initial application fees and annual fees specified below (OAR 340-216-8020, Table 2, Parts 1, 2 and 3) are only required for initial permit applications. These fees are not required for an application to renew or modify an existing permit. The appropriate specific activity fee(s) specified below (OAR 340-216-8020, Table 2, and Part 4) applies to permit modifications or may be in addition to initial permit application fees.

OAR 340-216-8020, Table 2, Part 1 – Initial Permitting Application Fees:		
Short Term Activity ACDP	☐	$4,500.00
Simple ACDP	☐	$9,000.00
Construction ACDP	☐	$14,400.00
Standard ACDP	✔	$18,000.00
Standard ACDP (Major NSR or Type A State NSR)	☐	$63,000.00
OAR 340-216-8020, Table 2, Part 2 – Annual Fees:		
Simple ACDP – Low fee class	☐	$3,917.00
Simple ACDP – High fee class	☐	$7,834.00
Standard ACDP	☐	$15,759.00
OAR 340-216-8020, Table 2, Part 3 – Cleaner Air Oregon Annual Fees:		
Simple ACDP - Low fee class	☐	$806.00
Simple ACDP - High fee class	☐	$1,612.00
Standard ACDP	☐	$3,225.00
OAR 340-216-8020, Table 2, Part 4 – Specific Activity Fees:		
Non-Technical Permit Modification	☐	$432.00
Basic Technical Permit Modification	☐	$540.00
Simple Technical Permit Modification	☐	$1,800.00
Moderate Technical Permit Modification	☐	$9,000.00
Complex Technical Permit Modification	☐	$18,000.00
Major NSR or type A State NSR Permit Modification	☐	$63,000.00
Modeling review (outside Major NSR or type A State NSR)	☐	$9,000.00
Public Hearing at Source's Request	☐	$3,600.00
State MACT determination	☐	$9,000.00
Compliance Order Monitoring	☐	$180.00/month

Total Fees:	**$18,000**

1. Company Information:

Legal Name:	Other company name (if different than legal name):
Calico Resources USA Corp.	

2. Site Contact Person:

(A person who deals with DEQ staff about equipment problems.)

Name:	Telephone number:	Fax:
Michael McGinnis	(775) 625-3600	
Title:	Email address:	
Authorized Field Representative	MMcGinnis@paramountnevada.com	
Mailing address:	City, State, Zip Code	

3. Facility Contact Person:

(If other than the site contact person, a person involved with all environmental issues at the facility although they may be housed at a different site.)

Name:	Telephone number:	Fax:
TBD		
Title:	Email address:	
Mailing address:	City, State, Zip Code	

4. Mailing Contact Person:

(If other than the site contact person, a person to whom the company would like all agency communications directed.)

Name:	Telephone number:	Fax:
TBD		
Title:	Email address:	
Mailing address:	City, State, Zip Code	

5. Invoice Contact Person:

(If other than the site contact person, a contact to which invoices and communications related to resolving invoice questions can be directed.)

Name:	Telephone number:	Fax:
Cheryl Evans	(775) 625-3600	
Title:	Email address:	
Administrative Manager	cheryl@paramountnevada.com	
Mailing address:	City, State, Zip Code	
665 Anderson St	Winnemucca, NV 89445	

Submit TWO copies of the completed application to the appropriate address below.

New or Modified Permits (include fees)

Oregon Department of Environmental Quality
Financial Services – Revenue Section
700 NE Multnomah St., Suite 600
Portland, OR 97232-4100

Permit Renewals (no fees)

Oregon Department of Environmental Quality

State of Oregon
DEQ Department of Environmental Quality

Cleaner Air Oregon Permit Application

Form AQ501

DEQ Use Only			
Permit or Source Number:		Type of Application:	
Application Number:		SIC/NAICS Code:	
Date Received:		Source Description:	
Regional Office: ER - AQ Permit Coordinator		Check No.:	Amount:

1. Company Information			2. Facility Location Information		
Legal Name: Calico Resources USA Corp.			Name: Grassy Mountain Mine		
Mailing Address: 665Anderson Street			Street Address: T21S, R44E		
City: Winnemuca	State: NV	Zip Code: 89445	City: Malheur Cour	County Malheur	Zip Code:
3. Facility Contact Information			**4. Facility Authorized Contact Information**		
Name/Title: TBD			Name/Title: Michael McGinnis, Authorized Field Represent		
Phone:			Phone: (775) 625-3600		
Email:			Email: MMcGinnis@paramountnevada.com		

5. Source Determination:

- ☐ Existing
- ☑ New
- ☐ Exempt [OAR 340-245-0050(6)] or Gas Combustion Exemption Emissions only [OAR 340-245-0050(5)]
- ☐ *De minimis* [OAR 340-245-0050(7)]

6. CAO Permit Application Checklist of Approved Documents [OAR 340-245-0100(3)]:

- ☑ Source description and process flow diagrams for each process (*Included in either the Modeling Protocol or Risk Assessment Work Plan*)
- ☑ Emissions Inventory
- ☑ Modeling Protocol
- ☑ Risk Assessment Work Plan (*for Level 3 or Level 4 Risk Assessment*)
- ☑ Risk Assessment (*Level 1, 2, 3 or 4*)
- ☐ TBACT or TLAER supporting documentation (*if applicable*)
- ☐ Pollution Prevention Analysis (*if applicable*)
- ☐ Risk Reduction Plan (*if applicable*)
- ☐ Postponement of Risk Reduction (*if applicable*)
- ☐ Air Monitoring Plan (*if applicable*)
- ☑ Additional supporting documentation requested by DEQ
- ☑ CAO applicable Activity Fees (see page 2)

7. Signature

I hereby apply for permission to discharge air contaminants in the State of Oregon, as stated or described in any part of this application, and certify that the information contained in any part of this application and the schedules and exhibits appended hereto, are true and correct to the best of my knowledge and belief.

Glen van Treek

Name of official



Signature of official

The following applicable fees[1] are due with the Cleaner Air Oregon Permit application form:
Qty. = Number of Activities

#	ACTIVITY	Qty.	Title V	Qty.	Standard ACDP	Qty.	Simple ACDP	Qty.	General/ Basic ACDP
3	Submittal Document Modification Fee(s)		$2,500		$2,500		$500		$250
4	Level 1 Risk Assessment - de minimis/no permit required		$1,500		$1,500		$1,000		$800
5	Level 1 Risk Assessment – not de minimis		$2,000		$2,000		$1,500		$1,100
6	Level 2 Risk Assessment - de minimis/no permit required		$3,100		$3,100		$2,300		$2,000
7	Level 2 Risk Assessment – not de minimis		$3,600		$3,600		$2,800		$2,300
8	Level 3 Risk Assessment - de minimis/no permit required	1	$8,800	1	$8,200		$5,300		$4,500
9	Level 3 Risk Assessment – not de minimis		$19,900		$11,300		$7,700		$6,300
10	Level 4 Risk Assessment - de minimis/no permit required		$21,400		$18,500		$11,700		NA
11	Level 4 Risk Assessment – not de minimis		$34,600		$25,800		$15,500		NA
12	Risk Reduction Plan Fee		$6,700		$6,700		$2,600		$2,600
13	Air Monitoring Plan Fee (includes risk assessment)		$25,900		$25,900		NA		NA
14	Postponement of Risk Reduction Fee		$4,400		$4,400		$4,400		$2,000
15	TBACT/TLAER Review (per Toxic Emissions Unit and type of toxic air contaminant)		$3,000		$3,000		$1,500		$1,500
16	TEU Risk Assessment – no permit mod		$1,000		$1,000		$500		$500
17	TEU Risk Assessment – permit mod		$4,000		$4,000		$2,000		$1,000
18	Level 2 Modeling review only for TEU approval		$1,900		$1,300		$800		$700
19	Level 3 Modeling review only for TEU approval		$3,800		$3,800		$3,500		$3,500
20	Community Engagement Meeting Fee – high		$8,000		$8,000		$8,000		$8,000
21	Community Engagement Meeting Fee – medium		$4,000		$4,000		$4,000		$4,000
22	Community Engagement Meeting Fee - low		$1,000		$1,000		$1,000		$1,000
23	Source Test Review Fee (plan and data review) - complex		$6,000		$6,000		$6,000		$6,000
24	Source Test Review Fee (plan and data review) – moderate		$4,200		$4,200		$4,200		$4,200
25	Source Test Review Fee (plan and data review) - simple		$1,400		$1,400		$1,400		$1,400

[1] – CAO Annual fees for new facilities are submitted as part of the ACDP Application fees as indicated on Form AQ101.

Total Fees:	$17,000

(Make check payable to DEQ)
Send payment to:

Oregon Department of Environmental Quality
Financial Services – Revenue Section
700 NE Multnomah St., Suite 600
Portland, OR 97232-4100

Facility Name: Grassy Mountain Mine Permit Number: N/A

1. Description of facility and processes:

The Project consists of an underground gold and silver ore mine using the Drift and Fill method, and a process facility to mill, refine, and melt gold and silver ore into doré bars for further processing off-site.

The underground mine will be developed by blasting, using emulsion, a level access tunnel and then mining drifts off of the main tunnel. As ore is removed, backfill from a nearby borrow pit will be hauled in to fill the drifts. Cemented rock fill (CRF) will be used for a portion of the backfill, requiring a batch cement plant at the surface. A mobile crushing unit will crush borrow material in the borrow pit, and material will be loaded and hauled to the waste rock storage facility, the CRF plant, or directly underground.

Ore removed from the mine is dumped by haul trucks directly into a mobile crushing unit that consists of a primary jaw crusher and a secondary screening/cone crusher unit. Crushed ore is then conveyed to a covered ore stockpile. A front-end loader transfers stockpiled ore to the mill via a feed conveyor; from here, the process is a closed, wet process. The ore slurry is sent directly to the carbon-in-leach (CIL) process. The CIL circuit consists of a pre-aeration tank, 2 leach tanks, and a series of 7 CIL tanks. Lime is added during pre-aeration to control pH, and cyanide is added to the first CIL tank. Leached gold and silver will be adsorbed onto granular carbon, which is present in all tanks. Slurry advances through each of the 7 tanks, once per day. Barren carbon is added to the last tank and flows through the circuit in the opposite direction: loaded carbon extracted for the elution process is removed from tank 1. The elution process strips gold and silver from the carbon into solution. Pregnant solution (solution loaded with gold and silver) is transferred to the gold room, and stripped carbon is regenerated in the propane-fired carbon regeneration kiln before being recycled for the leach process. Some carbon loss occurs during heating in the kiln, and new carbon is added along with regenerated carbon to CIL tank 7.

The gold room will house the electrowinning cells, retort, induction furnace, and associated support equipment. In the electrowinning cells, gold and silver are plated onto cathodes using electrolysis. Periodically, the electrowinning cells will be opened and the sludge cleaned out manually with a high-pressure spray gun. Sludge from the cells will flow by gravity to the electrowinning-sludge-filter feed tank and into manually operated pressure canister filters to be dewatered. Dewatered sludge is to be collected in trays and placed in the mercury retort to dry the sludge and remove mercury. Dried sludge will be removed from the retort and combined with fluxes in a flux mixer before being charged into the melting furnace, where the sludge is melted and poured into doré bars.

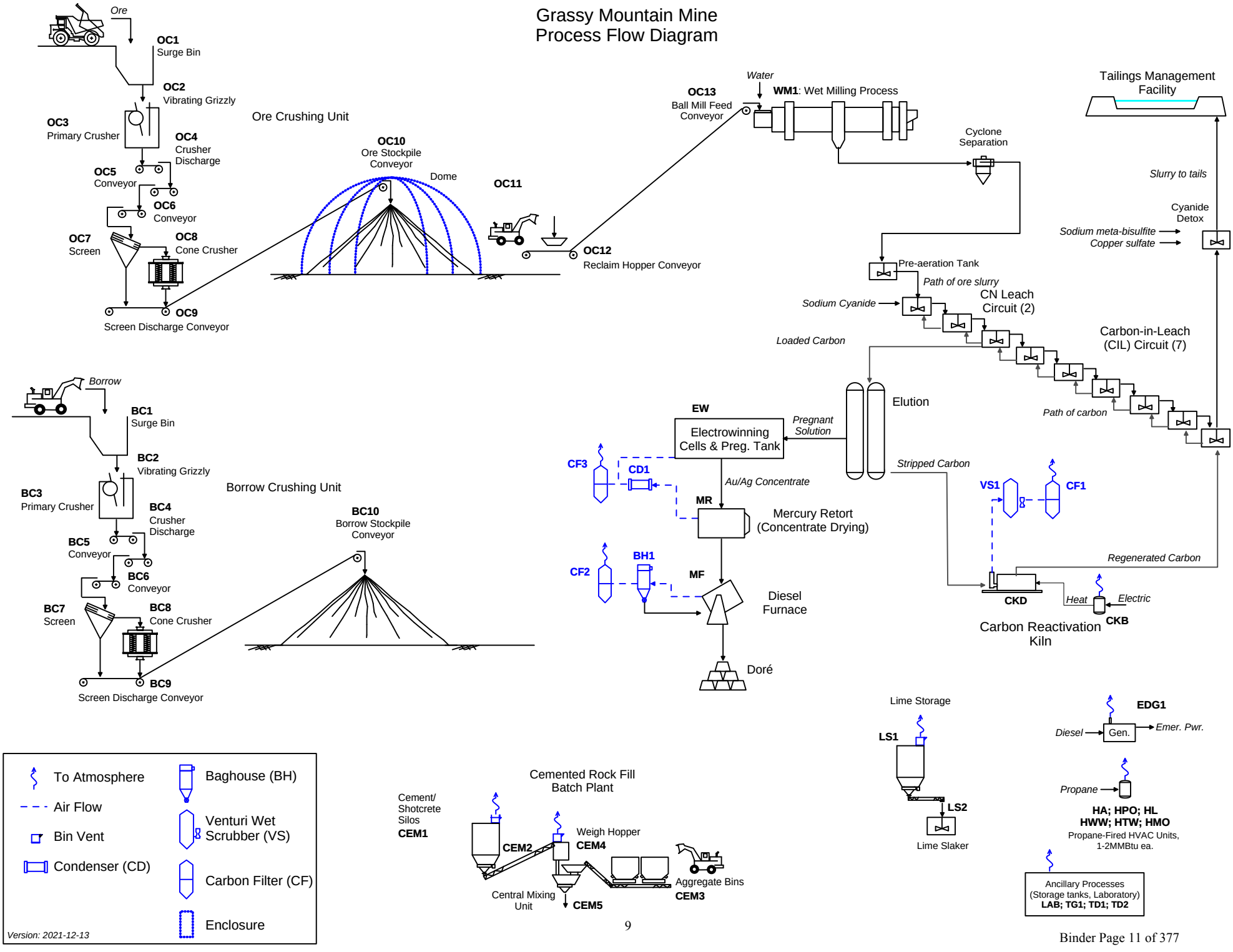
The CIL tailings will be pumped to the 2-stage agitated cyanide-detoxification tanks, where lime will be added to buffer pH, copper sulfate will be added as a reaction catalyst, and sodium meta-bisulfite will be added. Detoxified slurry will overflow the second detoxification tank to the final tailings pump box where it will be pumped to the tailings management facility by the final tailings pumps.

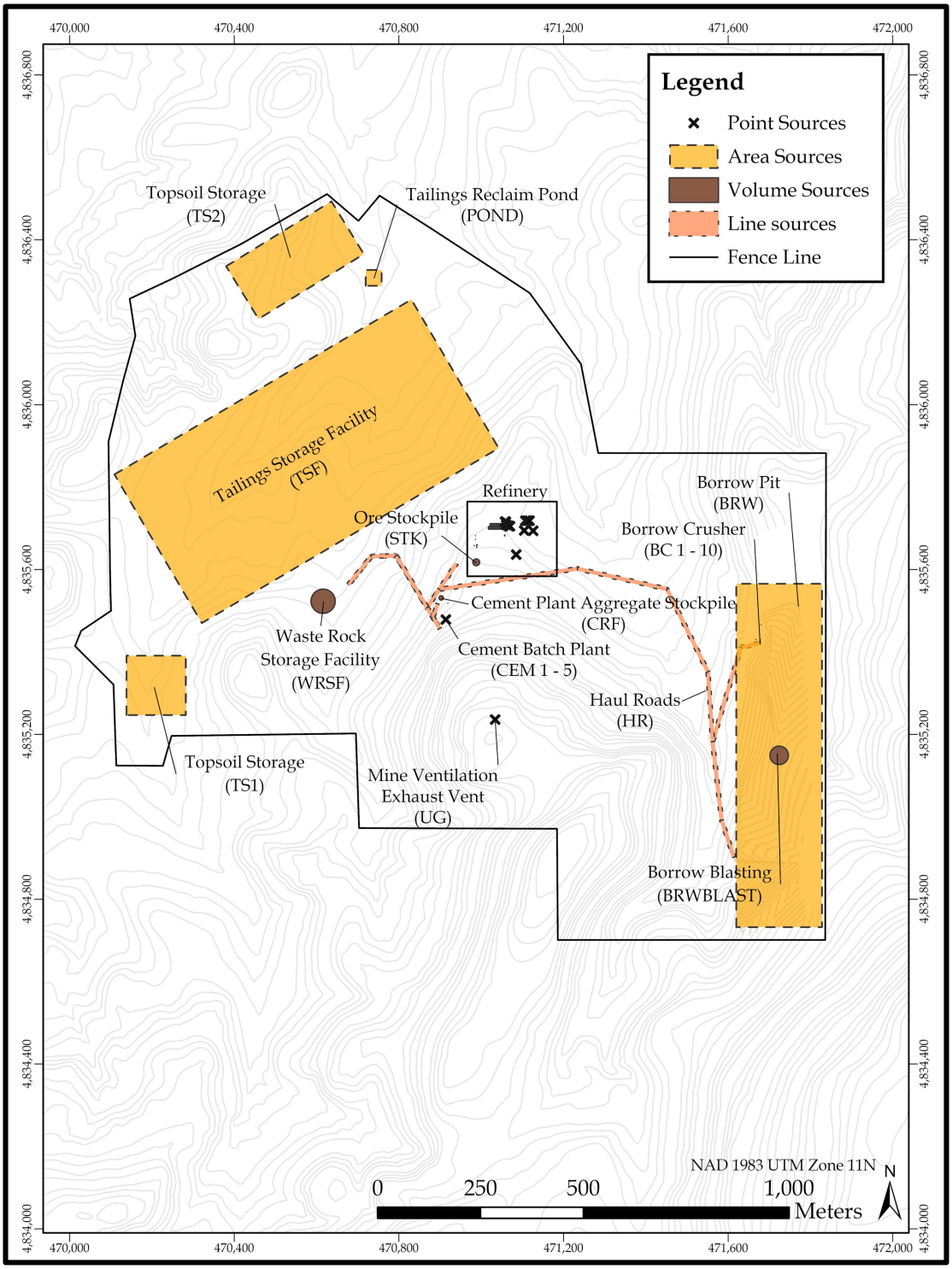
2. Attach plot plan.

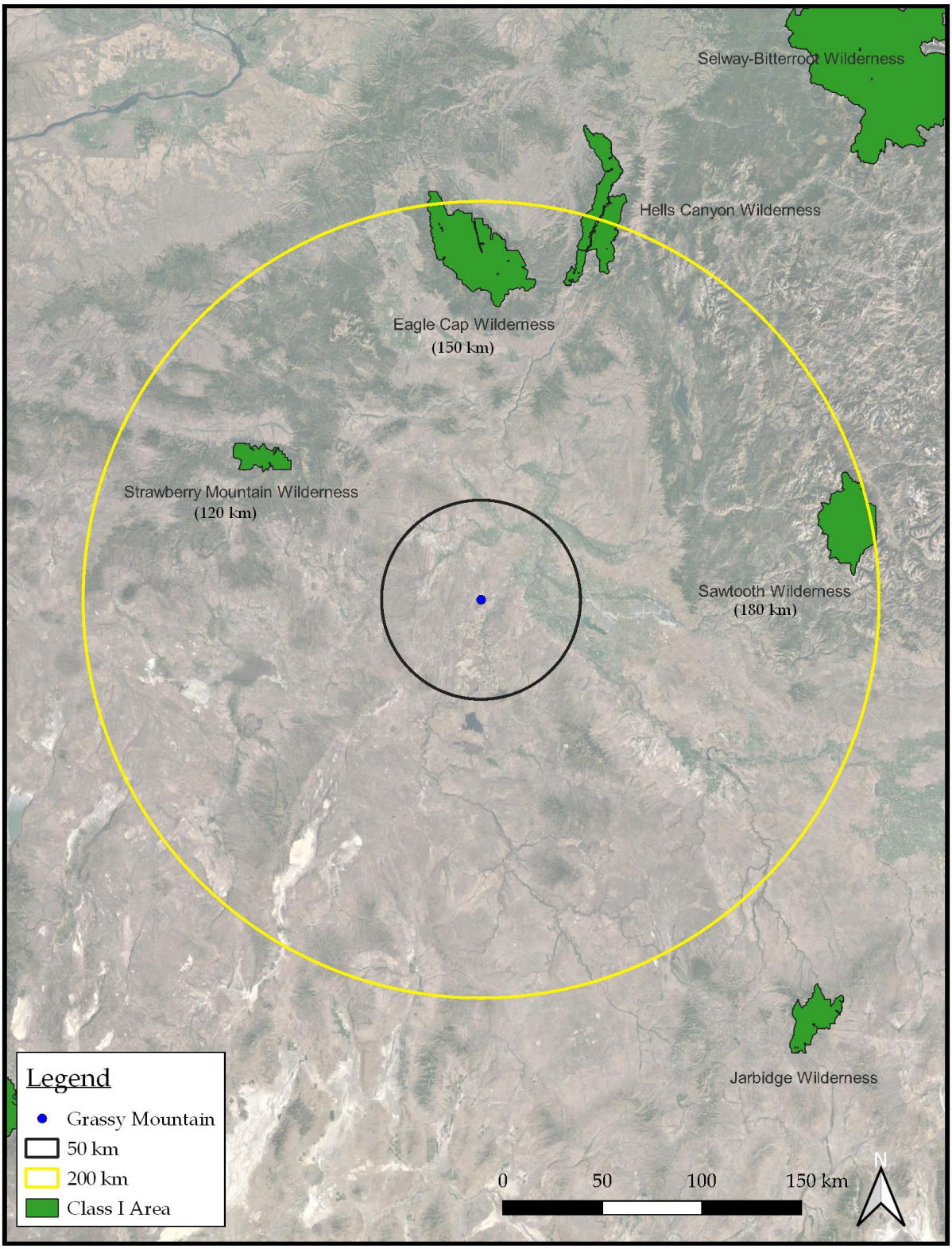
3. Attach process flow diagram.

4. Attach a city map or drawing showing the facility location.

Grassy Mountain Mine
Process Flow Diagram




Legend
Point Sources
Area Sources
Volume Sources
Line sources
Fence Line
Topsoil Storage (TS2)
Tailings Reclaim Pond (POND)
Tailings Storage Facility (TSF)
Refinery
Ore Stockpile (STK)
Borrow Pit (BRW)
Borrow Crusher (BC 1 - 10)
Cement Plant Aggregate Stockpile (CRF)
Waste Rock Storage Facility (WRSF)
Cement Batch Plant (CEM 1 - 5)
Haul Roads (HR)
Topsoil Storage (TS1)
Mine Ventilation Exhaust Vent (UG)
Borrow Blasting (BRWBLAST)
NAD 1983 UTM Zone 11N
N
0
250
500
1,000
Meters
470,000
470,400
470,800
471,200
471,600
472,000
4,836,800
4,836,400
4,836,000
4,835,600
4,835,200
4,834,800
4,834,400
4,834,000


Selway-Bitterroot Wilderness
Hells Canyon Wilderness
Eagle Cap Wilderness
(150 km)
Strawberry Mountain Wilderness
(120 km)
Sawtooth Wilderness
(180 km)
Jarbidge Wilderness
Legend
Grassy Mountain
50 km
200 km
Class I Area
0
50
100
150 km
N

1.2 AQ400 Series Forms

The following forms provide summary emissions information for all emissions points, including criteria pollutants and hazardous air pollutants. Because the facility has not operated, Form AQ402 will be completed instead of AQ401.

References for emission factors in form AQ402 refer to the emission inventory worksheets in Appendix A of the NSR Report. References for emission factors in form AQ403 refer to the emission inventory worksheets in Appendix E of the Risk Assessment Report.

Electronic versions of all AQ400 Series forms, as well as worksheets presented, are available upon request.

Facility Name: Grassy Mountain Mine Permit Number:

Table 1

1. Emissions Point	Production Rates		4. Pollutant	Emissions Factors			Emissions	
	2. Short-term (Specify units)	3. Annual (Specify units)		5. Short-term	6. Long-term	7. Reference(s)	8. Short-term (Specify units)	9. Annual (tons/year)
See attached tables.								
Example	200 tons of rock/hr	400,000 tons	PM	0.04 lb/ton	0.04 lb/ton	DEQ	8.0 lb/hr	8.0

1. Emissions Point	Production Rates		4. Pollutant	Emissions Factors			Emissions	
	2. Short-term (Specify units)	3. Annual (Specify units)		5. Short-term	6. Long-term	7. References	8. Short-term (Specify units)	9. Annual (tons/year)
OC1	816 ton Ore/day	297,840 ton Ore/year	PM	1.40E-04	1.40E-04	See Process Sheet	0.11 lbs/day	0.02
OC2	816 ton Ore/day	297,840 ton Ore/year	PM	1.40E-04	1.40E-04	See Process Sheet	0.11 lbs/day	0.02
OC3	816 ton Ore/day	297,840 ton Ore/year	PM	1.20E-03	1.20E-03	See Process Sheet	0.98 lbs/day	0.18
OC4	816 ton Ore/day	297,840 ton Ore/year	PM	1.40E-04	1.40E-04	See Process Sheet	0.11 lbs/day	0.02
OC5	816 ton Ore/day	297,840 ton Ore/year	PM	2.20E-03	2.20E-03	See Process Sheet	1.80 lbs/day	0.33
OC6	816 ton Ore/day	297,840 ton Ore/year	PM	1.40E-04	1.40E-04	See Process Sheet	0.11 lbs/day	0.02
OC7	816 ton Ore/day	297,840 ton Ore/year	PM	1.40E-04	1.40E-04	See Process Sheet	0.11 lbs/day	0.02
OC8	816 ton Ore/day	297,840 ton Ore/year	PM	1.20E-03	1.20E-03	See Process Sheet	0.98 lbs/day	0.18
OC9	816 ton Ore/day	297,840 ton Ore/year	PM	1.40E-04	1.40E-04	See Process Sheet	0.11 lbs/day	0.02
OC10	816 ton Ore/day	297,840 ton Ore/year	PM	1.40E-04	1.40E-04	See Process Sheet	0.11 lbs/day	0.02
OC11	816 ton Ore/day	297,840 ton Ore/year	PM	1.40E-04	1.40E-04	See Process Sheet	0.11 lbs/day	0.02
OC12	816 ton Ore/day	297,840 ton Ore/year	PM	1.40E-04	1.40E-04	See Process Sheet	0.11 lbs/day	0.02
OC13	816 ton Ore/day	297,840 ton Ore/year	PM	1.40E-04	1.40E-04	See Process Sheet	0.11 lbs/day	0.02
BC1	950 ton Borrow/day	247,000 ton Borrow/year	PM	3.00E-03	3.00E-03	See Process Sheet	2.85 lbs/day	0.37
BC2	950 ton Borrow/day	247,000 ton Borrow/year	PM	3.00E-03	3.00E-03	See Process Sheet	2.85 lbs/day	0.37
BC3	950 ton Borrow/day	247,000 ton Borrow/year	PM	5.40E-03	5.40E-03	See Process Sheet	5.13 lbs/day	0.67
BC4	950 ton Borrow/day	247,000 ton Borrow/year	PM	3.00E-03	3.00E-03	See Process Sheet	2.85 lbs/day	0.37
BC5	950 ton Borrow/day	247,000 ton Borrow/year	PM	3.00E-03	3.00E-03	See Process Sheet	2.85 lbs/day	0.37
BC6	950 ton Borrow/day	247,000 ton Borrow/year	PM	3.00E-03	3.00E-03	See Process Sheet	2.85 lbs/day	0.37
BC7	950 ton Borrow/day	247,000 ton Borrow/year	PM	0.03	0.03	See Process Sheet	23.75 lbs/day	3.09
BC8	950 ton Borrow/day	247,000 ton Borrow/year	PM	5.40E-03	5.40E-03	See Process Sheet	5.13 lbs/day	0.67
BC9	950 ton Borrow/day	247,000 ton Borrow/year	PM	3.00E-03	3.00E-03	See Process Sheet	2.85 lbs/day	0.37
BC10	950 ton Borrow/day	247,000 ton Borrow/year	PM	3.00E-03	3.00E-03	See Process Sheet	2.85 lbs/day	0.37
LS1	55 ton Lime/day	329 ton Lime/year	PM	9.90E-04	9.90E-04	See Process Sheet	0.05 lbs/day	1.63E-04
LS2	0.9 ton Lime/day	329 ton Lime/year	PM	4.80E-03	4.80E-03	See Process Sheet	4.32E-03 lbs/day	7.88E-04
CKD	4.8 ton Carbon/day	1,752 ton Carbon/year	PM	0.30	0.30	See Process Sheet	1.44 lbs/day	0.26
MF	15 hours/day	780 hours/year	PM	0.66	0.66	See Process Sheet	9.83 lbs/day	0.26
LABSP	6 ton Samples/day	2,190 ton Samples/year	PM	0.02	0.02	See Process Sheet	0.12 lbs/day	0.02
LABFA	0.03 ton Samples/day	9 ton Samples/year	PM	20.00	20.00	See Process Sheet	0.50 lbs/day	0.09
EDG1	2,000 kW Diesel/day	200,000 kW Diesel/year	PM	4.41E-04	4.41E-04	See Process Sheet	0.88 lbs/day	0.04
EDFP	200 kW Diesel/day	20,000 kW Diesel/year	PM	4.41E-04	4.41E-04	See Process Sheet	0.09 lbs/day	4.41E-03
HA	24 MMBtu Propane/day	8,760 MMBtu Propane/year	PM	7.65E-03	7.65E-03	See Process Sheet	0.18 lbs/day	0.03
HPO	24 MMBtu Propane/day	8,760 MMBtu Propane/year	PM	7.65E-03	7.65E-03	See Process Sheet	0.18 lbs/day	0.03
HL	24 MMBtu Propane/day	8,760 MMBtu Propane/year	PM	7.65E-03	7.65E-03	See Process Sheet	0.18 lbs/day	0.03
HWW	24 MMBtu Propane/day	8,760 MMBtu Propane/year	PM	7.65E-03	7.65E-03	See Process Sheet	0.18 lbs/day	0.03
HTW	48 MMBtu Propane/day	17,520 MMBtu Propane/year	PM	7.65E-03	7.65E-03	See Process Sheet	0.37 lbs/day	0.07
HMO	24 MMBtu Propane/day	8,760 MMBtu Propane/year	PM	7.65E-03	7.65E-03	See Process Sheet	0.18 lbs/day	0.03
CEM1	80 ton Cement/day	18,742 ton Cement/year	PM	9.90E-04	9.90E-04	See Process Sheet	0.08 lbs/day	9.28E-03
CEM2	80 ton Cement/day	18,742 ton Cement/year	PM	9.90E-04	9.90E-04	See Process Sheet	0.08 lbs/day	9.28E-03
CEM3	1,125 ton Aggregate/day	249,000 ton Aggregate/year	PM	6.90E-03	6.90E-03	See Process Sheet	7.76 lbs/day	0.86
CEM4	1,125 ton Aggregate/day	249,000 ton Aggregate/year	PM	4.80E-03	4.80E-03	See Process Sheet	5.40 lbs/day	0.60
CEM5	85 ton Cemented Rock Fill/day	18,742 ton Cemented Rock Fill/year	PM	0.02	0.02	See Process Sheet	1.56 lbs/day	0.17
UGD	1,400 ton Material Blasted/day	291,200 ton Material Blasted/year	PM	1.69E-04	1.69E-04	See Mine Sheets	0.24 lbs/day	0.02
UGB	14 Blasts/day	2,912 Blasts/year	PM	0.07	0.07	See Mine Sheets	0.91 lbs/day	0.09
UGH	187 VMT/day	38,930 VMT/year	PM	1.05	1.05	See Mine Sheets	195.82 lbs/day	20.37
UGM	1,400 ton Material Hauled/day	291,200 ton Material Hauled/year	PM	2.11E-04	2.11E-04	See Mine Sheets	0.29 lbs/day	0.03
UGG	125 VMT/day	25,958 VMT/year	PM	0.22	0.22	See Mine Sheets	26.89 lbs/day	2.80
BRWD	950 ton Material Blasted/day	247,000 ton Material Blasted/year	PM	6.84E-03	6.84E-03	See Mine Sheets	6.50 lbs/day	0.85
BRWBLAST	1 Blasts/day	26 Blasts/year	PM	4.95	4.95	See Mine Sheets	4.95 lbs/day	0.06
BRWM	950 ton Material Hauled/day	247,000 ton Material Hauled/year	PM	2.11E-04	2.11E-04	See Mine Sheets	0.20 lbs/day	0.03
BRWWE	0.2 acre Erodible Area/day	49 acre Erodible Area/year	PM	4.84	4.84	See Mine Sheets	0.92 lbs/day	0.12
WRSF	956 ton Material Hauled/day	248,500 ton Material Hauled/year	PM	2.45E-04	2.45E-04	See Mine Sheets	0.23 lbs/day	0.03
WRSFWE	0.2 acre Erodible Area/day	50 acre Erodible Area/year	PM	4.84	4.84	See Mine Sheets	0.92 lbs/day	0.12
CRF	1,195 ton Material Hauled/day	248,500 ton Material Hauled/year	PM	2.45E-04	2.45E-04	See Mine Sheets	0.29 lbs/day	0.03
CRFWE	0.2 acre Erodible Area/day	50 acre Erodible Area/year	PM	4.84	4.84	See Mine Sheets	0.92 lbs/day	0.12
STK	1,115 ton Material Hauled/day	289,700 ton Material Hauled/year	PM	3.38E-05	3.38E-05	See Mine Sheets	0.04 lbs/day	4.90E-03
STKWE	0.2 acre Erodible Area/day	58 acre Erodible Area/year	PM	4.84	4.84	See Mine Sheets	1.08 lbs/day	0.14
TS1	0.03 acre Erodible Area/day	7 acre Erodible Area/year	PM	4.84	4.84	See Mine Sheets	0.13 lbs/day	0.02
TS2	0.01 acre Erodible Area/day	3 acre Erodible Area/year	PM	4.84	4.84	See Mine Sheets	0.05 lbs/day	7.15E-03
HR	87 VMT/day	20,418 VMT/year	PM	3.38E-05	3.38E-05	See Mine Sheets	74.39 lbs/day	4.90E-03
HRG	57 VMT/day	11,830 VMT/year	PM	4.84	4.84	See Mine Sheets	24.51 lbs/day	0.02
HRWT	15 VMT/day	3,974 VMT/year	PM	4.84	4.84	See Mine Sheets	18.50 lbs/day	7.15E-03
EQP1	21.9 gal Diesel/day	4,553 gal Diesel/year	PM	0.01	0.01	See Nonroad Sheets	0.28 lbs/day	0.03
EQP2	321.0 gal Diesel/day	66,773 gal Diesel/year	PM	6.44E-03	6.44E-03	See Nonroad Sheets	2.07 lbs/day	0.21
EQP3	212.2 gal Diesel/day	44,143 gal Diesel/year	PM	6.44E-03	6.44E-03	See Nonroad Sheets	1.37 lbs/day	0.14
EQP4	22.8 gal Diesel/day	4,752 gal Diesel/year	PM	6.44E-04	6.44E-04	See Nonroad Sheets	1.47E-02 lbs/day	1.53E-03
EQP5	56.4 gal Diesel/day	11,741 gal Diesel/year	PM	9.65E-03	9.65E-03	See Nonroad Sheets	0.54 lbs/day	0.06
EQP6	29.2 gal Diesel/day	6,070 gal Diesel/year	PM	6.44E-04	6.44E-04	See Nonroad Sheets	1.88E-02 lbs/day	1.95E-03
EQP9	7.3 gal Diesel/day	1,518 gal Diesel/year	PM	9.65E-03	9.65E-03	See Nonroad Sheets	0.07 lbs/day	7.32E-03
EQP10	34.3 gal Diesel/day	7,130 gal Diesel/year	PM	9.65E-03	9.65E-03	See Nonroad Sheets	0.33 lbs/day	0.03
EQP11	42.0 gal Diesel/day	8,726 gal Diesel/year	PM	9.65E-03	9.65E-03	See Nonroad Sheets	0.40 lbs/day	0.04
EQP12	42.0 gal Diesel/day	8,726 gal Diesel/year	PM	6.44E-04	6.44E-04	See Nonroad Sheets	0.03 lbs/day	2.81E-03
TOTAL			**PM**				**450.9 lbs/day**	**49.5**

1. Emissions Point	Production Rates		4. Pollutant	Emissions Factors			Emissions	
	2. Short-term (Specify units)	3. Annual (Specify units)		5. Short-term	6. Long-term	7. References	8. Short-term (Specify units)	9. Annual (tons/year)
OC1	816 ton Ore/day	297,840 ton Ore/year	PM10	4.60E-05	4.60E-05	See Process Sheet	0.04 lbs/day	6.85E-03
OC2	816 ton Ore/day	297,840 ton Ore/year	PM10	4.60E-05	4.60E-05	See Process Sheet	0.04 lbs/day	6.85E-03
OC3	816 ton Ore/day	297,840 ton Ore/year	PM10	5.40E-04	5.40E-04	See Process Sheet	0.44 lbs/day	0.08
OC4	816 ton Ore/day	297,840 ton Ore/year	PM10	4.60E-05	4.60E-05	See Process Sheet	0.04 lbs/day	6.85E-03
OC5	816 ton Ore/day	297,840 ton Ore/year	PM10	7.40E-04	7.40E-04	See Process Sheet	0.60 lbs/day	0.11
OC6	816 ton Ore/day	297,840 ton Ore/year	PM10	4.60E-05	4.60E-05	See Process Sheet	0.04 lbs/day	6.85E-03
OC7	816 ton Ore/day	297,840 ton Ore/year	PM10	4.60E-05	4.60E-05	See Process Sheet	0.04 lbs/day	6.85E-03
OC8	816 ton Ore/day	297,840 ton Ore/year	PM10	5.40E-04	5.40E-04	See Process Sheet	0.44 lbs/day	0.08
OC9	816 ton Ore/day	297,840 ton Ore/year	PM10	4.60E-05	4.60E-05	See Process Sheet	0.04 lbs/day	6.85E-03
OC10	816 ton Ore/day	297,840 ton Ore/year	PM10	4.60E-05	4.60E-05	See Process Sheet	0.04 lbs/day	6.85E-03
OC11	816 ton Ore/day	297,840 ton Ore/year	PM10	4.60E-05	4.60E-05	See Process Sheet	0.04 lbs/day	6.85E-03
OC12	816 ton Ore/day	297,840 ton Ore/year	PM10	4.60E-05	4.60E-05	See Process Sheet	0.04 lbs/day	6.85E-03
OC13	816 ton Ore/day	297,840 ton Ore/year	PM10	4.60E-05	4.60E-05	See Process Sheet	0.04 lbs/day	6.85E-03
BC1	950 ton Borrow/day	247,000 ton Borrow/year	PM10	1.10E-03	1.10E-03	See Process Sheet	1.05 lbs/day	0.14
BC2	950 ton Borrow/day	247,000 ton Borrow/year	PM10	1.10E-03	1.10E-03	See Process Sheet	1.05 lbs/day	0.14
BC3	950 ton Borrow/day	247,000 ton Borrow/year	PM10	2.40E-03	2.40E-03	See Process Sheet	2.28 lbs/day	0.30
BC4	950 ton Borrow/day	247,000 ton Borrow/year	PM10	1.10E-03	1.10E-03	See Process Sheet	1.05 lbs/day	0.14
BC5	950 ton Borrow/day	247,000 ton Borrow/year	PM10	1.10E-03	1.10E-03	See Process Sheet	1.05 lbs/day	0.14
BC6	950 ton Borrow/day	247,000 ton Borrow/year	PM10	1.10E-03	1.10E-03	See Process Sheet	1.05 lbs/day	0.14
BC7	950 ton Borrow/day	247,000 ton Borrow/year	PM10	8.70E-03	8.70E-03	See Process Sheet	8.27 lbs/day	1.07
BC8	950 ton Borrow/day	247,000 ton Borrow/year	PM10	2.40E-03	2.40E-03	See Process Sheet	2.28 lbs/day	0.30
BC9	950 ton Borrow/day	247,000 ton Borrow/year	PM10	1.10E-03	1.10E-03	See Process Sheet	1.05 lbs/day	0.14
BC10	950 ton Borrow/day	247,000 ton Borrow/year	PM10	1.10E-03	1.10E-03	See Process Sheet	1.05 lbs/day	0.14
LS1	55 ton Lime/day	329 ton Lime/year	PM10	3.40E-04	3.40E-04	See Process Sheet	1.87E-02 lbs/day	5.58E-05
LS2	0.9 ton Lime/day	329 ton Lime/year	PM10	2.80E-03	2.80E-03	See Process Sheet	2.52E-03 lbs/day	4.60E-04
CKD	4.8 ton Carbon/day	1,752 ton Carbon/year	PM10	0.30	0.30	See Process Sheet	1.44 lbs/day	0.26
MF	15 hours/day	780 hours/year	PM10	0.66	0.66	See Process Sheet	9.83 lbs/day	0.26
LABSP	6 ton Samples/day	2,190 ton Samples/year	PM10	7.72E-03	7.72E-03	See Process Sheet	0.05 lbs/day	8.45E-03
LABFA	0.03 ton Samples/day	9 ton Samples/year	PM10	20.00	20.00	See Process Sheet	0.50 lbs/day	0.09
EDG1	2,000 kW Diesel/day	200,000 kW Diesel/year	PM10	4.41E-04	4.41E-04	See Process Sheet	0.88 lbs/day	0.04
EDFP	200 kW Diesel/day	20,000 kW Diesel/year	PM10	4.41E-04	4.41E-04	See Process Sheet	0.09 lbs/day	4.41E-03
HA	24 MMBtu Propane/day	8,760 MMBtu Propane/year	PM10	7.65E-03	7.65E-03	See Process Sheet	0.18 lbs/day	0.03
HPO	24 MMBtu Propane/day	8,760 MMBtu Propane/year	PM10	7.65E-03	7.65E-03	See Process Sheet	0.18 lbs/day	0.03
HL	24 MMBtu Propane/day	8,760 MMBtu Propane/year	PM10	7.65E-03	7.65E-03	See Process Sheet	0.18 lbs/day	0.03
HWW	24 MMBtu Propane/day	8,760 MMBtu Propane/year	PM10	7.65E-03	7.65E-03	See Process Sheet	0.18 lbs/day	0.03
HTW	48 MMBtu Propane/day	17,520 MMBtu Propane/year	PM10	7.65E-03	7.65E-03	See Process Sheet	0.37 lbs/day	0.07
HMO	24 MMBtu Propane/day	8,760 MMBtu Propane/year	PM10	7.65E-03	7.65E-03	See Process Sheet	0.18 lbs/day	0.03
CEM1	80 ton Cement/day	18,742 ton Cement/year	PM10	3.40E-04	3.40E-04	See Process Sheet	0.03 lbs/day	3.19E-03
CEM2	80 ton Cement/day	18,742 ton Cement/year	PM10	3.40E-04	3.40E-04	See Process Sheet	0.03 lbs/day	3.19E-03
CEM3	1,125 ton Aggregate/day	249,000 ton Aggregate/year	PM10	3.30E-03	3.30E-03	See Process Sheet	3.71 lbs/day	0.41
CEM4	1,125 ton Aggregate/day	249,000 ton Aggregate/year	PM10	2.80E-03	2.80E-03	See Process Sheet	3.15 lbs/day	0.35
CEM5	85 ton Cemented Rock Fill/day	18,742 ton Cemented Rock Fill/year	PM10	5.50E-03	5.50E-03	See Process Sheet	0.47 lbs/day	0.05
UGD	1,400 ton Material Blasted/day	291,200 ton Material Blasted/year	PM10	8.00E-05	8.00E-05	See Mine Sheets	0.11 lbs/day	0.01
UGB	14 Blasts/day	2,912 Blasts/year	PM10	0.03	0.03	See Mine Sheets	0.47 lbs/day	0.05
UGH	187 VMT/day	38,930 VMT/year	PM10	0.28	0.28	See Mine Sheets	51.83 lbs/day	5.39
UGM	1,400 ton Material Hauled/day	291,200 ton Material Hauled/year	PM10	9.96E-05	9.96E-05	See Mine Sheets	0.14 lbs/day	0.01
UGG	125 VMT/day	25,958 VMT/year	PM10	0.06	0.06	See Mine Sheets	8.07 lbs/day	0.84
BRWD	950 ton Material Blasted/day	247,000 ton Material Blasted/year	PM10	3.56E-03	3.56E-03	See Mine Sheets	3.38 lbs/day	0.44
BRWBLAST	1 Blasts/day	26 Blasts/year	PM10	2.57	2.57	See Mine Sheets	2.57 lbs/day	0.03
BRWM	950 ton Material Hauled/day	247,000 ton Material Hauled/year	PM10	1.00E-04	1.00E-04	See Mine Sheets	0.10 lbs/day	0.01
BRWWE	0.2 acre Erodible Area/day	49 acre Erodible Area/year	PM10	2.42	2.42	See Mine Sheets	0.46 lbs/day	0.06
WRSF	956 ton Material Hauled/day	248,500 ton Material Hauled/year	PM10	1.16E-04	1.16E-04	See Mine Sheets	0.11 lbs/day	0.01
WRSFWE	0.2 acre Erodible Area/day	50 acre Erodible Area/year	PM10	2.42	2.42	See Mine Sheets	0.46 lbs/day	0.06
CRF	1,195 ton Material Hauled/day	248,500 ton Material Hauled/year	PM10	1.16E-04	1.16E-04	See Mine Sheets	0.14 lbs/day	0.01
CRFWE	0.2 acre Erodible Area/day	50 acre Erodible Area/year	PM10	2.42	2.42	See Mine Sheets	0.46 lbs/day	0.06
STK	1,115 ton Material Hauled/day	289,700 ton Material Hauled/year	PM10	1.60E-05	1.60E-05	See Mine Sheets	1.78E-02 lbs/day	2.32E-03
STKWE	0.2 acre Erodible Area/day	58 acre Erodible Area/year	PM10	2.42	2.42	See Mine Sheets	0.54 lbs/day	0.07
TS1	0.03 acre Erodible Area/day	7 acre Erodible Area/year	PM10	2.42	2.42	See Mine Sheets	0.07 lbs/day	8.65E-03
TS2	0.01 acre Erodible Area/day	3 acre Erodible Area/year	PM10	2.42	2.42	See Mine Sheets	0.03 lbs/day	3.57E-03
HR	87 VMT/day	20,418 VMT/year	PM10	0.23	0.23	See Mine Sheets	19.69 lbs/day	2.30
HRG	57 VMT/day	11,830 VMT/year	PM10	0.13	0.13	See Mine Sheets	7.35 lbs/day	0.76
HRWT	15 VMT/day	3,974 VMT/year	PM10	0.32	0.32	See Mine Sheets	4.90 lbs/day	0.64
EQP1	21.9 gal Diesel/day	4,553 gal Diesel/year	PM10	0.01	0.01	See Nonroad Sheets	0.28 lbs/day	0.03
EQP2	321.0 gal Diesel/day	66,773 gal Diesel/year	PM10	6.44E-03	6.44E-03	See Nonroad Sheets	2.07 lbs/day	0.21
EQP3	212.2 gal Diesel/day	44,143 gal Diesel/year	PM10	6.44E-03	6.44E-03	See Nonroad Sheets	1.37 lbs/day	0.14
EQP4	22.8 gal Diesel/day	4,752 gal Diesel/year	PM10	6.44E-04	6.44E-04	See Nonroad Sheets	1.47E-02 lbs/day	1.53E-03
EQP5	56.4 gal Diesel/day	11,741 gal Diesel/year	PM10	9.65E-03	9.65E-03	See Nonroad Sheets	0.54 lbs/day	0.06
EQP6	29.2 gal Diesel/day	6,070 gal Diesel/year	PM10	6.44E-04	6.44E-04	See Nonroad Sheets	1.88E-02 lbs/day	1.95E-03
EQP9	7.3 gal Diesel/day	1,518 gal Diesel/year	PM10	9.65E-03	9.65E-03	See Nonroad Sheets	0.07 lbs/day	7.32E-03
EQP10	34.3 gal Diesel/day	7,130 gal Diesel/year	PM10	9.65E-03	9.65E-03	See Nonroad Sheets	0.33 lbs/day	0.03
EQP11	42.0 gal Diesel/day	8,726 gal Diesel/year	PM10	9.65E-03	9.65E-03	See Nonroad Sheets	0.40 lbs/day	0.04
EQP12	42.0 gal Diesel/day	8,726 gal Diesel/year	PM10	6.44E-04	6.44E-04	See Nonroad Sheets	0.03 lbs/day	2.81E-03
TOTAL			**PM10**				**149.5 lbs/day**	**16.0**

1. Emissions Point	Production Rates		4. Pollutant	Emissions Factors			Emissions	
	2. Short-term (Specify units)	3. Annual (Specify units)		5. Short-term	6. Long-term	7. References	8. Short-term (Specify units)	9. Annual (tons/year)
CKD	0.2 ton Carbon/hour	1,752 ton Carbon/year	CO	5.25	5.25	See Process Sheet	1.05 lbs/hour	4.60
MF	0.6 MMBtu Diesel/hour	468 MMBtu Diesel/year	CO	0.04	0.04	See Process Sheet	0.02 lbs/hour	8.54E-03
EDG1	2,000 kW Diesel/hour	200,000 kW Diesel/year	CO	7.72E-03	7.72E-03	See Process Sheet	15.43 lbs/hour	0.77
EDFP	200 kW Diesel/hour	20,000 kW Diesel/year	CO	7.72E-03	7.72E-03	See Process Sheet	1.54 lbs/hour	0.08
HA	1 MMBtu Propane/hour	8,760 MMBtu Propane/year	CO	0.08	0.08	See Process Sheet	0.08 lbs/hour	0.36
HPO	1 MMBtu Propane/hour	8,760 MMBtu Propane/year	CO	0.08	0.08	See Process Sheet	0.08 lbs/hour	0.36
HL	1 MMBtu Propane/hour	8,760 MMBtu Propane/year	CO	0.08	0.08	See Process Sheet	0.08 lbs/hour	0.36
HWW	1 MMBtu Propane/hour	8,760 MMBtu Propane/year	CO	0.08	0.08	See Process Sheet	0.08 lbs/hour	0.36
HTW	2 MMBtu Propane/hour	17,520 MMBtu Propane/year	CO	0.08	0.08	See Process Sheet	0.16 lbs/hour	0.72
HMO	1 MMBtu Propane/hour	8,760 MMBtu Propane/year	CO	0.08	0.08	See Process Sheet	0.08 lbs/hour	0.36
UGB	58 Blasts/hour	291,200 Blasts/year	CO	0.06	0.06	See Mine Sheets	3.45 lbs/hour	8.60
BRWBLAST	1 Blast/hour	26 Blasts/year	CO	175.88	175.88	See Mine Sheets	175.88 lbs/hour	2.29
EQP1	0.9 gal Diesel/hour	4,553 gal Diesel/year	CO	0.16	0.16	See Nonroad Sheets	0.15 lbs/hour	0.37
EQP2	13.4 gal Diesel/hour	66,773 gal Diesel/year	CO	0.11	0.11	See Nonroad Sheets	1.51 lbs/hour	3.76
EQP3	8.8 gal Diesel/hour	44,143 gal Diesel/year	CO	0.11	0.11	See Nonroad Sheets	1.00 lbs/hour	2.49
EQP4	1.0 gal Diesel/hour	4,752 gal Diesel/year	CO	0.16	0.16	See Nonroad Sheets	0.15 lbs/hour	0.38
EQP5	2.4 gal Diesel/hour	11,741 gal Diesel/year	CO	0.16	0.16	See Nonroad Sheets	0.38 lbs/hour	0.94
EQP6	1.2 gal Diesel/hour	6,070 gal Diesel/year	CO	0.16	0.16	See Nonroad Sheets	0.20 lbs/hour	0.49
EQP9	0.3 gal Diesel/hour	1,518 gal Diesel/year	CO	0.16	0.16	See Nonroad Sheets	0.05 lbs/hour	0.12
EQP10	1.4 gal Diesel/hour	7,130 gal Diesel/year	CO	0.16	0.16	See Nonroad Sheets	0.23 lbs/hour	0.57
EQP11	1.7 gal Diesel/hour	8,726 gal Diesel/year	CO	0.16	0.16	See Nonroad Sheets	0.28 lbs/hour	0.70
EQP12	1.7 gal Diesel/hour	8,726 gal Diesel/year	CO	0.16	0.16	See Nonroad Sheets	0.28 lbs/hour	0.70
TOTAL			**CO**				**202.2 lbs/hour**	**29.4**

1. Emissions Point	Production Rates		4. Pollutant	Emissions Factors			Emissions	
	2. Short-term (Specify units)	3. Annual (Specify units)		5. Short-term	6. Long-term	7. References	8. Short-term (Specify units)	9. Annual (tons/year)
MF	0.6 MMBtu Diesel/hour	468 MMBtu Diesel/year	NOx	0.15	0.15	See Process Sheet	0.09 lbs/hour	0.03
EDG1	2,000 kW Diesel/hour	200,000 kW Diesel/year	NOx	0.01	0.01	See Process Sheet	28.22 lbs/hour	1.41
EDFP	200 kW Diesel/hour	20,000 kW Diesel/year	NOx	8.82E-03	8.82E-03	See Process Sheet	1.76 lbs/hour	0.09
HA	1 MMBtu Propane/hour	8,760 MMBtu Propane/year	NOx	0.14	0.14	See Process Sheet	0.14 lbs/hour	0.62
HPO	1 MMBtu Propane/hour	8,760 MMBtu Propane/year	NOx	0.14	0.14	See Process Sheet	0.14 lbs/hour	0.62
HL	1 MMBtu Propane/hour	8,760 MMBtu Propane/year	NOx	0.14	0.14	See Process Sheet	0.14 lbs/hour	0.62
HWW	1 MMBtu Propane/hour	8,760 MMBtu Propane/year	NOx	0.14	0.14	See Process Sheet	0.14 lbs/hour	0.62
HTW	2 MMBtu Propane/hour	17,520 MMBtu Propane/year	NOx	0.14	0.14	See Process Sheet	0.28 lbs/hour	1.24
HMO	1 MMBtu Propane/hour	8,760 MMBtu Propane/year	NOx	0.14	0.14	See Process Sheet	0.14 lbs/hour	0.62
UGB	58 Blasts/hour	291,200 Blasts/year	NOx	0.01	0.01	See Mine Sheets	0.65 lbs/hour	1.63
BRWBLAST	1 Blast/hour	26 Blasts/year	NOx	4.73	4.73	See Mine Sheets	4.73 lbs/hour	0.06
EQP1	0.9 gal Diesel/hour	4,553 gal Diesel/year	NOx	0.24	0.24	See Nonroad Sheets	0.22 lbs/hour	0.55
EQP2	13.4 gal Diesel/hour	66,773 gal Diesel/year	NOx	0.13	0.13	See Nonroad Sheets	1.72 lbs/hour	4.30
EQP3	8.8 gal Diesel/hour	44,143 gal Diesel/year	NOx	0.13	0.13	See Nonroad Sheets	1.14 lbs/hour	2.84
EQP4	1.0 gal Diesel/hour	4,752 gal Diesel/year	NOx	0.01	0.01	See Nonroad Sheets	1.23E-02 lbs/hour	0.03
EQP5	2.4 gal Diesel/hour	11,741 gal Diesel/year	NOx	0.13	0.13	See Nonroad Sheets	0.30 lbs/hour	0.76
EQP6	1.2 gal Diesel/hour	6,070 gal Diesel/year	NOx	0.01	0.01	See Nonroad Sheets	1.57E-02 lbs/hour	0.04
EQP9	0.3 gal Diesel/hour	1,518 gal Diesel/year	NOx	0.13	0.13	See Nonroad Sheets	0.04 lbs/hour	0.10
EQP10	1.4 gal Diesel/hour	7,130 gal Diesel/year	NOx	0.13	0.13	See Nonroad Sheets	0.18 lbs/hour	0.46
EQP11	1.7 gal Diesel/hour	8,726 gal Diesel/year	NOx	0.13	0.13	See Nonroad Sheets	0.22 lbs/hour	0.56
EQP12	1.7 gal Diesel/hour	8,726 gal Diesel/year	NOx	0.01	0.01	See Nonroad Sheets	0.02 lbs/hour	0.06
TOTAL			**NOx**				**40.3 lbs/hour**	**17.3**

1. Emissions Point	Production Rates		4. Pollutant	Emissions Factors			Emissions	
	2. Short-term (Specify units)	3. Annual (Specify units)		5. Short-term	6. Long-term	7. References	8. Short-term (Specify units)	9. Annual (tons/year)
MF	0.6 MMBtu Diesel/hour	468 MMBtu Diesel/year	SO2	0.52	0.52	See Process Sheet	0.31 lbs/hour	0.12
EDG1	2,000 kW Diesel/hour	200,000 kW Diesel/year	SO2	1.45E-05	1.45E-05	See Process Sheet	0.03 lbs/hour	1.45E-03
EDFP	200 kW Diesel/hour	20,000 kW Diesel/year	SO2	1.45E-05	1.45E-05	See Process Sheet	2.90E-03 lbs/hour	1.45E-04
HA	1 MMBtu Propane/hour	8,760 MMBtu Propane/year	SO2	0.02	0.02	See Process Sheet	1.74E-02 lbs/hour	0.08
HPO	1 MMBtu Propane/hour	8,760 MMBtu Propane/year	SO2	0.02	0.02	See Process Sheet	1.74E-02 lbs/hour	0.08
HL	1 MMBtu Propane/hour	8,760 MMBtu Propane/year	SO2	0.02	0.02	See Process Sheet	1.74E-02 lbs/hour	0.08
HWW	1 MMBtu Propane/hour	8,760 MMBtu Propane/year	SO2	0.02	0.02	See Process Sheet	1.74E-02 lbs/hour	0.08
HTW	2 MMBtu Propane/hour	17,520 MMBtu Propane/year	SO2	0.02	0.02	See Process Sheet	0.03 lbs/hour	0.15
HMO	1 MMBtu Propane/hour	8,760 MMBtu Propane/year	SO2	0.02	0.02	See Process Sheet	1.74E-02 lbs/hour	0.08
UGB	58 Blasts/hour	291,200 Blasts/year	SO2	6.54E-06	6.54E-06	See Mine Sheets	3.82E-04 lbs/hour	9.52E-04
BRWBLAST	1 Blast/hour	26 Blasts/year	SO2	9.45E-03	9.45E-03	See Mine Sheets	9.45E-03 lbs/hour	1.23E-04
EQP1	0.9 gal Diesel/hour	4,553 gal Diesel/year	SO2	2.11E-04	2.11E-04	See Nonroad Sheets	1.93E-04 lbs/hour	4.81E-04
EQP2	13.4 gal Diesel/hour	66,773 gal Diesel/year	SO2	2.11E-04	2.11E-04	See Nonroad Sheets	2.83E-03 lbs/hour	7.05E-03
EQP3	8.8 gal Diesel/hour	44,143 gal Diesel/year	SO2	2.11E-04	2.11E-04	See Nonroad Sheets	1.87E-03 lbs/hour	4.66E-03
EQP4	1.0 gal Diesel/hour	4,752 gal Diesel/year	SO2	2.11E-04	2.11E-04	See Nonroad Sheets	2.01E-04 lbs/hour	5.02E-04
EQP5	2.4 gal Diesel/hour	11,741 gal Diesel/year	SO2	2.11E-04	2.11E-04	See Nonroad Sheets	4.97E-04 lbs/hour	1.24E-03
EQP6	1.2 gal Diesel/hour	6,070 gal Diesel/year	SO2	2.11E-04	2.11E-04	See Nonroad Sheets	2.57E-04 lbs/hour	6.41E-04
EQP9	0.3 gal Diesel/hour	1,518 gal Diesel/year	SO2	2.11E-04	2.11E-04	See Nonroad Sheets	6.42E-05 lbs/hour	1.60E-04
EQP10	1.4 gal Diesel/hour	7,130 gal Diesel/year	SO2	2.11E-04	2.11E-04	See Nonroad Sheets	3.02E-04 lbs/hour	7.53E-04
EQP11	1.7 gal Diesel/hour	8,726 gal Diesel/year	SO2	2.11E-04	2.11E-04	See Nonroad Sheets	3.69E-04 lbs/hour	9.22E-04
EQP12	1.7 gal Diesel/hour	8,726 gal Diesel/year	SO2	2.11E-04	2.11E-04	See Nonroad Sheets	3.69E-04 lbs/hour	9.22E-04
TOTAL			**SO2**				**0.48 lbs/hour**	**0.67**

1. Emissions Point	Production Rates		4. Pollutant	Emissions Factors			Emissions	
	2. Short-term (Specify units)	3. Annual (Specify units)		5. Short-term	6. Long-term	7. References	8. Short-term (Specify units)	9. Annual (tons/year)
MF	4 MMBtu Diesel/day	468 MMBtu Diesel/year	VOC	2.48E-03	2.48E-03	See Process Sheet	1.12E-02 lbs/day	5.81E-04
EDG1	2,000 kW Diesel/day	200,000 kW Diesel/year	VOC	2.87E-03	2.87E-03	See Process Sheet	5.73 lbs/day	0.29
EDFP	200 kW Diesel/day	20,000 kW Diesel/year	VOC	8.82E-03	8.82E-03	See Process Sheet	1.76 lbs/day	0.09
HA	24 MMBtu Propane/day	8,760 MMBtu Propane/year	VOC	8.74E-03	8.74E-03	See Process Sheet	0.21 lbs/day	0.04
HPO	24 MMBtu Propane/day	8,760 MMBtu Propane/year	VOC	8.74E-03	8.74E-03	See Process Sheet	0.21 lbs/day	0.04
HL	24 MMBtu Propane/day	8,760 MMBtu Propane/year	VOC	8.74E-03	8.74E-03	See Process Sheet	0.21 lbs/day	0.04
HWW	24 MMBtu Propane/day	8,760 MMBtu Propane/year	VOC	8.74E-03	8.74E-03	See Process Sheet	0.21 lbs/day	0.04
HTW	48 MMBtu Propane/day	17,520 MMBtu Propane/year	VOC	8.74E-03	8.74E-03	See Process Sheet	0.42 lbs/day	0.08
HMO	24 MMBtu Propane/day	8,760 MMBtu Propane/year	VOC	8.74E-03	8.74E-03	See Process Sheet	0.21 lbs/day	0.04
TG1	24 hours/day	8,760 hours/year	VOC	0.21	0.21	See Process Sheet	5.07 lbs/day	0.93
TD1	24 hours/day	8,760 hours/year	VOC	9.34E-04	9.34E-04	See Process Sheet	0.02 lbs/day	4.09E-03
TD2	24 hours/day	8,760 hours/year	VOC	9.82E-05	9.82E-05	See Process Sheet	2.36E-03 lbs/day	4.30E-04
EQP1	21.9 gal Diesel/day	4,553 gal Diesel/year	VOC	0.24	0.24	See Nonroad Sheets	5.28 lbs/day	0.55
EQP2	321.0 gal Diesel/day	66,773 gal Diesel/year	VOC	0.13	0.13	See Nonroad Sheets	41.32 lbs/day	4.30
EQP3	212.2 gal Diesel/day	44,143 gal Diesel/year	VOC	0.13	0.13	See Nonroad Sheets	27.31 lbs/day	2.84
EQP4	22.8 gal Diesel/day	4,752 gal Diesel/year	VOC	6.11E-03	6.11E-03	See Nonroad Sheets	0.14 lbs/day	0.01
EQP5	56.4 gal Diesel/day	11,741 gal Diesel/year	VOC	0.13	0.13	See Nonroad Sheets	7.27 lbs/day	0.76
EQP6	29.2 gal Diesel/day	6,070 gal Diesel/year	VOC	6.11E-03	6.11E-03	See Nonroad Sheets	0.18 lbs/day	0.02
EQP9	7.3 gal Diesel/day	1,518 gal Diesel/year	VOC	0.13	0.13	See Nonroad Sheets	0.94 lbs/day	0.10
EQP10	34.3 gal Diesel/day	7,130 gal Diesel/year	VOC	0.13	0.13	See Nonroad Sheets	4.41 lbs/day	0.46
EQP11	42.0 gal Diesel/day	8,726 gal Diesel/year	VOC	0.13	0.13	See Nonroad Sheets	5.40 lbs/day	0.56
EQP12	42.0 gal Diesel/day	8,726 gal Diesel/year	VOC	6.11E-03	6.11E-03	See Nonroad Sheets	0.26 lbs/day	0.03
TOTAL			**VOC**				**106.6 lbs/day**	**11.2**

Facility Name: Grassy Mountain Mine Permit Number:

Table 2

1. Device/process ID	2. PM_{10} PSEL (tons/year)	3. $PM_{2.5}$ fraction (f)	4. Reference	5. $PM_{2.5}$ PSEL (tons/yr)
See attached table.				
TOTAL	0.0			0.0

1. Device/Process ID	2. PM10 PSEL (tons/year)	3. PM2.5 fraction	4. Reference	5. PM2.5 PSEL (tons/yr)
OC1	6.85E-03	0.28	See Process Sheet	1.94E-03
OC2	6.85E-03	0.28	See Process Sheet	1.94E-03
OC3	0.08	0.19	See Process Sheet	0.01
OC4	6.85E-03	0.28	See Process Sheet	1.94E-03
OC5	0.11	0.07	See Process Sheet	7.45E-03
OC6	6.85E-03	0.28	See Process Sheet	1.94E-03
OC7	6.85E-03	0.28	See Process Sheet	1.94E-03
OC8	0.08	0.19	See Process Sheet	0.01
OC9	6.85E-03	0.28	See Process Sheet	1.94E-03
OC10	6.85E-03	0.28	See Process Sheet	1.94E-03
OC11	6.85E-03	0.28	See Process Sheet	1.94E-03
OC12	6.85E-03	0.28	See Process Sheet	1.94E-03
OC13	6.85E-03	0.28	See Process Sheet	1.94E-03
BC1	0.14	0.15	See Process Sheet	0.02
BC2	0.14	0.15	See Process Sheet	0.02
BC3	0.30	0.15	See Process Sheet	0.04
BC4	0.14	0.15	See Process Sheet	0.02
BC5	0.14	0.15	See Process Sheet	0.02
BC6	0.14	0.15	See Process Sheet	0.02
BC7	1.07	0.15	See Process Sheet	0.16
BC8	0.30	0.15	See Process Sheet	0.04
BC9	0.14	0.15	See Process Sheet	0.02
BC10	0.14	0.15	See Process Sheet	0.02
LS1	5.58E-05	0.15	See Process Sheet	8.21E-06
LS2	4.60E-04	0.14	See Process Sheet	6.57E-05
CKD	0.26	1.0	See Process Sheet	0.26
MF	0.26	1.0	See Process Sheet	0.26
LABSP	8.45E-03	0.10	See Process Sheet	8.08E-04
LABFA	0.09	1.0	See Process Sheet	0.09
EDG1	0.04	1.0	See Process Sheet	0.04
EDFP	4.41E-03	1.0	See Process Sheet	4.41E-03
HA	0.03	1.0	See Process Sheet	0.03
HPO	0.03	1.0	See Process Sheet	0.03
HL	0.03	1.0	See Process Sheet	0.03
HWW	0.03	1.0	See Process Sheet	0.03
HTW	0.07	1.0	See Process Sheet	0.07
HMO	0.03	1.0	See Process Sheet	0.03
CEM1	3.19E-03	0.15	See Process Sheet	4.69E-04
CEM2	3.19E-03	0.15	See Process Sheet	4.69E-04
CEM3	0.41	0.15	See Process Sheet	0.06
CEM4	0.35	0.14	See Process Sheet	0.05
CEM5	0.05	0.15	See Process Sheet	7.50E-03
UGD	0.01	0.15	See Mine Sheets	1.76E-03
UGB	0.05	0.06	See Mine Sheets	2.84E-03
UGH	5.39	0.10	See Mine Sheets	0.54
UGM	0.01	0.15	See Mine Sheets	2.20E-03
UGG	0.84	0.10	See Mine Sheets	0.09
BRWD	0.44	0.06	See Mine Sheets	0.03
BRWBLAST	0.03	0.06	See Mine Sheets	1.93E-03
BRWM	0.01	0.15	See Mine Sheets	1.87E-03
BRWWE	0.06	0.15	See Mine Sheets	8.94E-03
WRSF	0.01	0.15	See Mine Sheets	2.18E-03
WRSFWE	0.06	0.15	See Mine Sheets	8.99E-03
CRF	0.01	0.15	See Mine Sheets	2.18E-03
CRFWE	0.06	0.15	See Mine Sheets	8.99E-03
STK	2.32E-03	0.15	See Mine Sheets	3.51E-04
STKWE	0.07	0.15	See Mine Sheets	0.01
TS1	8.65E-03	0.15	See Mine Sheets	1.30E-03
TS2	3.57E-03	0.15	See Mine Sheets	5.36E-04
HR	2.30	0.10	See Mine Sheets	0.23
HRG	0.76	0.10	See Mine Sheets	0.08
HRWT	0.64	0.10	See Mine Sheets	0.06
EQP1	0.03	1.0	See Nonroad Sheets	0.03
EQP2	0.21	1.0	See Nonroad Sheets	0.21
EQP3	0.14	1.0	See Nonroad Sheets	0.14
EQP4	1.53E-03	1.0	See Nonroad Sheets	1.53E-03
EQP5	0.06	1.0	See Nonroad Sheets	0.06
EQP6	1.95E-03	1.0	See Nonroad Sheets	1.95E-03
EQP9	7.32E-03	1.0	See Nonroad Sheets	7.32E-03
EQP10	0.03	1.0	See Nonroad Sheets	0.03
EQP11	0.04	1.0	See Nonroad Sheets	0.04
EQP12	2.81E-03	1.0	See Nonroad Sheets	2.81E-03
TOTAL	**16.0**			**3.1**

Facility Name: Grassy Mountain Mine Permit Number:

Emissions Data

1. Emissions Point	2. Annual Production Rate (specify units)	3. Pollutant	4. Emission Factor	5. EF reference	6. Annual Emissions (tons/yr)
See attached table.					

Applications for Standard ACDPs must also include the most recent Toxics Release Inventory report, if applicable (see instructions).

1. Emissions Point	Annual Production Rat	3. Pollutant	4. Emission Factor	5. EF Reference	6. Annual Emissions (tons/yr)
TG1	120000 gal	1,2,4-Trimethylbenzene	3.86E-04	See Tank Emission Calculations Sheet, p. 1	2.32E-02
TD1	240000 gal	1,2,4-Trimethylbenzene	3.41E-07	See Tank Emission Calculations Sheet, p. 1	4.09E-05
TD2	15000 gal	1,2,4-Trimethylbenzene	5.73E-07	See Tank Emission Calculations Sheet, p. 1	4.30E-06
TOTAL		**1,2,4-Trimethylbenzene**			**2.32E-02**
UB	530 ton	1,3-Butadiene	1.52E-03	See Mine TAC and GHG Emissions Sheet, p. 3	4.02E-04
BRWB	69 ton	1,3-Butadiene	1.52E-03	See Mine TAC and GHG Emissions Sheet, p. 3	5.19E-05
UDP	22487 MMBtu	1,3-Butadiene	1.59E-03	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.78E-02
EDG1	1878 MMBtu	1,3-Butadiene	1.59E-03	See Process TAC and GHG Emissions Sheet, p. 6	1.49E-03
MFD	468 MMBtu	1,3-Butadiene	1.08E-04	See Process TAC and GHG Emissions Sheet, p. 4	2.53E-05
EDFP	188 MMBtu	1,3-Butadiene	1.59E-03	See Process TAC and GHG Emissions Sheet, p. 6	1.49E-04
TOTAL		**1,3-Butadiene**			**2.00E-02**
UB	530 ton	1,3,5-Trimethylbenzene	5.60E-04	See Mine TAC and GHG Emissions Sheet, p. 3	1.48E-04
BRWB	69 ton	1,3,5-Trimethylbenzene	5.60E-04	See Mine TAC and GHG Emissions Sheet, p. 3	1.91E-05
TOTAL		**1,3,5-Trimethylbenzene**			**1.67E-04**
HA	8760 MMBtu	2-Methyl naphthalene	2.35E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-07
HPO	8760 MMBtu	2-Methyl naphthalene	2.35E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-07
HL	8760 MMBtu	2-Methyl naphthalene	2.35E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-07
HWW	8760 MMBtu	2-Methyl naphthalene	2.35E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-07
HTW	17520 MMBtu	2-Methyl naphthalene	2.35E-08	See Process TAC and GHG Emissions Sheet, p. 2	2.06E-07
HMO	8760 MMBtu	2-Methyl naphthalene	2.35E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-07
MFD	468 MMBtu	2-Methyl naphthalene	1.02E-06	See Process TAC and GHG Emissions Sheet, p. 4	2.39E-07
TOTAL		**2-Methyl naphthalene**			**9.60E-07**
HA	8760 MMBtu	3-Methylcholanthrene	1.76E-09	See Process TAC and GHG Emissions Sheet, p. 2	7.73E-09
HPO	8760 MMBtu	3-Methylcholanthrene	1.76E-09	See Process TAC and GHG Emissions Sheet, p. 2	7.73E-09
HL	8760 MMBtu	3-Methylcholanthrene	1.76E-09	See Process TAC and GHG Emissions Sheet, p. 2	7.73E-09
HWW	8760 MMBtu	3-Methylcholanthrene	1.76E-09	See Process TAC and GHG Emissions Sheet, p. 2	7.73E-09
HTW	17520 MMBtu	3-Methylcholanthrene	1.76E-09	See Process TAC and GHG Emissions Sheet, p. 2	1.55E-08
HMO	8760 MMBtu	3-Methylcholanthrene	1.76E-09	See Process TAC and GHG Emissions Sheet, p. 2	7.73E-09
TOTAL		**3-Methylcholanthrene**			**5.41E-08**
HA	8760 MMBtu	7,12-Dimethylbenz[a]anthracene	1.57E-08	See Process TAC and GHG Emissions Sheet, p. 2	6.87E-08
HPO	8760 MMBtu	7,12-Dimethylbenz[a]anthracene	1.57E-08	See Process TAC and GHG Emissions Sheet, p. 2	6.87E-08
HL	8760 MMBtu	7,12-Dimethylbenz[a]anthracene	1.57E-08	See Process TAC and GHG Emissions Sheet, p. 2	6.87E-08
HWW	8760 MMBtu	7,12-Dimethylbenz[a]anthracene	1.57E-08	See Process TAC and GHG Emissions Sheet, p. 2	6.87E-08
HTW	17520 MMBtu	7,12-Dimethylbenz[a]anthracene	1.57E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.37E-07
HMO	8760 MMBtu	7,12-Dimethylbenz[a]anthracene	1.57E-08	See Process TAC and GHG Emissions Sheet, p. 2	6.87E-08
TOTAL		**7,12-Dimethylbenz[a]anthracene**			**4.81E-07**
HA	8760 MMBtu	Acenaphthene	1.36E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.97E-09
HPO	8760 MMBtu	Acenaphthene	1.36E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.97E-09
HL	8760 MMBtu	Acenaphthene	1.36E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.97E-09
HWW	8760 MMBtu	Acenaphthene	1.36E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.97E-09
HTW	17520 MMBtu	Acenaphthene	1.36E-09	See Process TAC and GHG Emissions Sheet, p. 2	1.19E-08
HMO	8760 MMBtu	Acenaphthene	1.36E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.97E-09
UDP	22487 MMBtu	Acenaphthene	2.45E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.75E-04
EDG1	1878 MMBtu	Acenaphthene	2.45E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.30E-05
MFD	468 MMBtu	Acenaphthene	1.54E-06	See Process TAC and GHG Emissions Sheet, p. 4	3.60E-07
EDFP	188 MMBtu	Acenaphthene	2.45E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.30E-06
TOTAL		**Acenaphthene**			**3.01E-04**
HA	8760 MMBtu	Acenaphthylene	1.19E-08	See Process TAC and GHG Emissions Sheet, p. 2	5.20E-08
HPO	8760 MMBtu	Acenaphthylene	1.19E-08	See Process TAC and GHG Emissions Sheet, p. 2	5.20E-08
HL	8760 MMBtu	Acenaphthylene	1.19E-08	See Process TAC and GHG Emissions Sheet, p. 2	5.20E-08
HWW	8760 MMBtu	Acenaphthylene	1.19E-08	See Process TAC and GHG Emissions Sheet, p. 2	5.20E-08
HTW	17520 MMBtu	Acenaphthylene	1.19E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.04E-07
HMO	8760 MMBtu	Acenaphthylene	1.19E-08	See Process TAC and GHG Emissions Sheet, p. 2	5.20E-08
UDP	22487 MMBtu	Acenaphthylene	2.97E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.34E-04
EDG1	1878 MMBtu	Acenaphthylene	2.97E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.79E-05
MFD	468 MMBtu	Acenaphthylene	4.74E-07	See Process TAC and GHG Emissions Sheet, p. 4	1.11E-07
EDFP	188 MMBtu	Acenaphthylene	2.97E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.79E-06
TOTAL		**Acenaphthylene**			**3.65E-04**
HA	8760 MMBtu	Acetaldehyde	1.37E-05	See Process TAC and GHG Emissions Sheet, p. 2	6.00E-05
HPO	8760 MMBtu	Acetaldehyde	1.37E-05	See Process TAC and GHG Emissions Sheet, p. 2	6.00E-05
HL	8760 MMBtu	Acetaldehyde	1.37E-05	See Process TAC and GHG Emissions Sheet, p. 2	6.00E-05
HWW	8760 MMBtu	Acetaldehyde	1.37E-05	See Process TAC and GHG Emissions Sheet, p. 2	6.00E-05
HTW	17520 MMBtu	Acetaldehyde	1.37E-05	See Process TAC and GHG Emissions Sheet, p. 2	1.20E-04
HMO	8760 MMBtu	Acetaldehyde	1.37E-05	See Process TAC and GHG Emissions Sheet, p. 2	6.00E-05
UDP	22487 MMBtu	Acetaldehyde	5.72E-03	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.43E-02
EDG1	1878 MMBtu	Acetaldehyde	5.72E-03	See Process TAC and GHG Emissions Sheet, p. 6	5.37E-03
MFD	468 MMBtu	Acetaldehyde	2.56E-03	See Process TAC and GHG Emissions Sheet, p. 4	5.99E-04
EDFP	188 MMBtu	Acetaldehyde	5.72E-03	See Process TAC and GHG Emissions Sheet, p. 6	5.37E-04
TOTAL		**Acetaldehyde**			**7.12E-02**
UB	530 ton	Acetone	1.36E-03	See Mine TAC and GHG Emissions Sheet, p. 3	3.60E-04
BRWB	69 ton	Acetone	1.36E-03	See Mine TAC and GHG Emissions Sheet, p. 3	4.64E-05
TOTAL		**Acetone**			**4.06E-04**
UB	530 ton	Acetonitrile	2.00E-02	See Mine TAC and GHG Emissions Sheet, p. 3	5.29E-03
BRWB	69 ton	Acetonitrile	2.00E-02	See Mine TAC and GHG Emissions Sheet, p. 3	6.83E-04
TOTAL		**Acetonitrile**			**5.97E-03**
UB	530 ton	Acrolein	2.00E-03	See Mine TAC and GHG Emissions Sheet, p. 3	5.29E-04
BRWB	69 ton	Acrolein	2.00E-03	See Mine TAC and GHG Emissions Sheet, p. 3	6.83E-05
HA	8760 MMBtu	Acrolein	4.74E-06	See Process TAC and GHG Emissions Sheet, p. 2	2.08E-05
HPO	8760 MMBtu	Acrolein	4.74E-06	See Process TAC and GHG Emissions Sheet, p. 2	2.08E-05
HL	8760 MMBtu	Acrolein	4.74E-06	See Process TAC and GHG Emissions Sheet, p. 2	2.08E-05
HWW	8760 MMBtu	Acrolein	4.74E-06	See Process TAC and GHG Emissions Sheet, p. 2	2.08E-05
HTW	17520 MMBtu	Acrolein	4.74E-06	See Process TAC and GHG Emissions Sheet, p. 2	4.16E-05
HMO	8760 MMBtu	Acrolein	4.74E-06	See Process TAC and GHG Emissions Sheet, p. 2	2.08E-05
UDP	22487 MMBtu	Acrolein	2.47E-04	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.78E-03
EDG1	1878 MMBtu	Acrolein	2.47E-04	See Process TAC and GHG Emissions Sheet, p. 6	2.32E-04
MFD	468 MMBtu	Acrolein	2.56E-03	See Process TAC and GHG Emissions Sheet, p. 4	5.99E-04
EDFP	188 MMBtu	Acrolein	2.47E-04	See Process TAC and GHG Emissions Sheet, p. 6	2.32E-05
TOTAL		**Acrolein**			**4.38E-03**
UB	530 ton	Acrylonitrile	3.80E-03	See Mine TAC and GHG Emissions Sheet, p. 3	1.01E-03
BRWB	69 ton	Acrylonitrile	3.80E-03	See Mine TAC and GHG Emissions Sheet, p. 3	1.30E-04
TOTAL		**Acrylonitrile**			**1.13E-03**
HA	8760 MMBtu	Ammonia	1.76E-02	See Process TAC and GHG Emissions Sheet, p. 2	7.73E-02
HPO	8760 MMBtu	Ammonia	1.76E-02	See Process TAC and GHG Emissions Sheet, p. 2	7.73E-02
HL	8760 MMBtu	Ammonia	1.76E-02	See Process TAC and GHG Emissions Sheet, p. 2	7.73E-02
HWW	8760 MMBtu	Ammonia	1.76E-02	See Process TAC and GHG Emissions Sheet, p. 2	7.73E-02
HTW	17520 MMBtu	Ammonia	1.76E-02	See Process TAC and GHG Emissions Sheet, p. 2	1.55E-01
HMO	8760 MMBtu	Ammonia	1.76E-02	See Process TAC and GHG Emissions Sheet, p. 2	7.73E-02
UDP	22487 MMBtu	Ammonia	2.12E-02	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.38E-01
EDG1	1878 MMBtu	Ammonia	2.12E-02	See Process TAC and GHG Emissions Sheet, p. 6	1.99E-02
MFD	468 MMBtu	Ammonia	2.12E-02	See Process TAC and GHG Emissions Sheet, p. 4	4.95E-03
EDFP	188 MMBtu	Ammonia	2.12E-02	See Process TAC and GHG Emissions Sheet, p. 6	1.99E-03
TOTAL		**Ammonia**			**8.06E-01**
HA	8760 MMBtu	Anthracene	1.58E-09	See Process TAC and GHG Emissions Sheet, p. 2	6.91E-09
HPO	8760 MMBtu	Anthracene	1.58E-09	See Process TAC and GHG Emissions Sheet, p. 2	6.91E-09
HL	8760 MMBtu	Anthracene	1.58E-09	See Process TAC and GHG Emissions Sheet, p. 2	6.91E-09
HWW	8760 MMBtu	Anthracene	1.58E-09	See Process TAC and GHG Emissions Sheet, p. 2	6.91E-09

HTW	17520 MMBtu	Anthracene	1.58E-09	See Process TAC and GHG Emissions Sheet, p. 2	1.38E-08
HMO	8760 MMBtu	Anthracene	1.58E-09	See Process TAC and GHG Emissions Sheet, p. 2	6.91E-09
UDP	22487 MMBtu	Anthracene	2.93E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.30E-04
EDG1	1878 MMBtu	Anthracene	2.93E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.75E-05
MFD	468 MMBtu	Anthracene	1.74E-07	See Process TAC and GHG Emissions Sheet, p. 4	4.08E-08
EDFP	188 MMBtu	Anthracene	2.93E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.75E-06
TOTAL		**Anthracene**			**3.60E-04**
OC	297840 ton	Antimony and compounds	2.49E-07	See Process TAC and GHG Emissions Sheet, p. 9	3.70E-05
BC	247000 ton	Antimony and compounds	2.76E-06	See Process TAC and GHG Emissions Sheet, p. 9	3.40E-04
CKD	1752 ton	Antimony and compounds	1.24E-05	See Process TAC and GHG Emissions Sheet, p. 9	1.09E-05
MFP	468 MMBtu	Antimony and compounds	4.53E-05	See Process TAC and GHG Emissions Sheet, p. 9	1.06E-05
UFD	291200 ton	Antimony and compounds	4.35E-08	See Mine TAC and GHG Emissions Sheet, p. 1	6.33E-06
AFD	247000 ton	Antimony and compounds	5.81E-07	See Mine TAC and GHG Emissions Sheet, p. 1	7.18E-05
CEM3	249000 ton	Antimony and compounds	3.35E-07	See Process TAC and GHG Emissions Sheet, p. 9	4.17E-05
CEM4	249000 ton	Antimony and compounds	2.33E-07	See Process TAC and GHG Emissions Sheet, p. 9	2.90E-05
TOTAL		**Antimony and compounds**			**5.48E-04**
OC	297840 ton	Arsenic and compounds	9.25E-07	See Process TAC and GHG Emissions Sheet, p. 9	1.38E-04
BC	247000 ton	Arsenic and compounds	8.10E-06	See Process TAC and GHG Emissions Sheet, p. 9	1.00E-03
UBD	1234 MMBtu	Arsenic and compounds	4.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	2.47E-06
BRWBD	160 MMBtu	Arsenic and compounds	4.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	3.18E-07
HA	8760 MMBtu	Arsenic and compounds	1.96E-07	See Process TAC and GHG Emissions Sheet, p. 2	8.59E-07
HPO	8760 MMBtu	Arsenic and compounds	1.96E-07	See Process TAC and GHG Emissions Sheet, p. 2	8.59E-07
HL	8760 MMBtu	Arsenic and compounds	1.96E-07	See Process TAC and GHG Emissions Sheet, p. 2	8.59E-07
HWW	8760 MMBtu	Arsenic and compounds	1.96E-07	See Process TAC and GHG Emissions Sheet, p. 2	8.59E-07
HTW	17520 MMBtu	Arsenic and compounds	1.96E-07	See Process TAC and GHG Emissions Sheet, p. 2	1.72E-06
HMO	8760 MMBtu	Arsenic and compounds	1.96E-07	See Process TAC and GHG Emissions Sheet, p. 2	8.59E-07
CKD	1752 ton	Arsenic and compounds	4.63E-05	See Process TAC and GHG Emissions Sheet, p. 9	4.05E-05
MFP	468 MMBtu	Arsenic and compounds	1.69E-04	See Process TAC and GHG Emissions Sheet, p. 9	3.94E-05
UFD	291200 ton	Arsenic and compounds	1.58E-07	See Mine TAC and GHG Emissions Sheet, p. 1	2.30E-05
AFD	247000 ton	Arsenic and compounds	1.79E-06	See Mine TAC and GHG Emissions Sheet, p. 1	2.21E-04
CEM1	18742 ton	Arsenic and compounds	1.42E-07	See Process TAC and GHG Emissions Sheet, p. 12	1.33E-06
CEM2	18742 ton	Arsenic and compounds	1.42E-07	See Process TAC and GHG Emissions Sheet, p. 12	1.33E-06
CEM3	249000 ton	Arsenic and compounds	9.84E-07	See Process TAC and GHG Emissions Sheet, p. 9	1.23E-04
CEM4	249000 ton	Arsenic and compounds	6.85E-07	See Process TAC and GHG Emissions Sheet, p. 9	8.52E-05
CEM5	18742 ton	Arsenic and compounds	2.96E-07	See Process TAC and GHG Emissions Sheet, p. 12	2.77E-06
UDP	22487 MMBtu	Arsenic and compounds	1.17E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.31E-04
EDG1	1878 MMBtu	Arsenic and compounds	1.17E-05	See Process TAC and GHG Emissions Sheet, p. 6	1.10E-05
MFD	468 MMBtu	Arsenic and compounds	1.17E-05	See Process TAC and GHG Emissions Sheet, p. 4	2.73E-06
EDFP	188 MMBtu	Arsenic and compounds	1.17E-05	See Process TAC and GHG Emissions Sheet, p. 6	1.10E-06
TOTAL		**Arsenic and compounds**			**1.83E-03**
OC	297840 ton	Barium and compounds	3.97E-06	See Process TAC and GHG Emissions Sheet, p. 9	5.91E-04
BC	247000 ton	Barium and compounds	4.18E-05	See Process TAC and GHG Emissions Sheet, p. 9	5.17E-03
HA	8760 MMBtu	Barium and compounds	4.31E-06	See Process TAC and GHG Emissions Sheet, p. 2	1.89E-05
HPO	8760 MMBtu	Barium and compounds	4.31E-06	See Process TAC and GHG Emissions Sheet, p. 2	1.89E-05
HL	8760 MMBtu	Barium and compounds	4.31E-06	See Process TAC and GHG Emissions Sheet, p. 2	1.89E-05
HWW	8760 MMBtu	Barium and compounds	4.31E-06	See Process TAC and GHG Emissions Sheet, p. 2	1.89E-05
HTW	17520 MMBtu	Barium and compounds	4.31E-06	See Process TAC and GHG Emissions Sheet, p. 2	3.78E-05
HMO	8760 MMBtu	Barium and compounds	4.31E-06	See Process TAC and GHG Emissions Sheet, p. 2	1.89E-05
CKD	1752 ton	Barium and compounds	1.98E-04	See Process TAC and GHG Emissions Sheet, p. 9	1.74E-04
MFP	468 MMBtu	Barium and compounds	7.23E-04	See Process TAC and GHG Emissions Sheet, p. 9	1.69E-04
UFD	291200 ton	Barium and compounds	6.90E-07	See Mine TAC and GHG Emissions Sheet, p. 1	1.00E-04
AFD	247000 ton	Barium and compounds	8.90E-06	See Mine TAC and GHG Emissions Sheet, p. 1	1.10E-03
CEM3	249000 ton	Barium and compounds	5.08E-06	See Process TAC and GHG Emissions Sheet, p. 9	6.33E-04
CEM4	249000 ton	Barium and compounds	3.54E-06	See Process TAC and GHG Emissions Sheet, p. 9	4.40E-04
TOTAL		**Barium and compounds**			**8.51E-03**
HA	8760 MMBtu	Benz[a]anthracene	1.92E-09	See Process TAC and GHG Emissions Sheet, p. 2	8.42E-09
HPO	8760 MMBtu	Benz[a]anthracene	1.92E-09	See Process TAC and GHG Emissions Sheet, p. 2	8.42E-09
HL	8760 MMBtu	Benz[a]anthracene	1.92E-09	See Process TAC and GHG Emissions Sheet, p. 2	8.42E-09
HWW	8760 MMBtu	Benz[a]anthracene	1.92E-09	See Process TAC and GHG Emissions Sheet, p. 2	8.42E-09
HTW	17520 MMBtu	Benz[a]anthracene	1.92E-09	See Process TAC and GHG Emissions Sheet, p. 2	1.68E-08
HMO	8760 MMBtu	Benz[a]anthracene	1.92E-09	See Process TAC and GHG Emissions Sheet, p. 2	8.42E-09
UDP	22487 MMBtu	Benz[a]anthracene	2.85E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.20E-04
EDG1	1878 MMBtu	Benz[a]anthracene	2.85E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.67E-05
MFD	468 MMBtu	Benz[a]anthracene	9.85E-08	See Process TAC and GHG Emissions Sheet, p. 4	2.31E-08
EDFP	188 MMBtu	Benz[a]anthracene	2.85E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.67E-06
TOTAL		**Benz[a]anthracene**			**3.50E-04**
UB	530 ton	Benzene	2.40E-02	See Mine TAC and GHG Emissions Sheet, p. 3	6.35E-03
BRWB	69 ton	Benzene	2.40E-02	See Mine TAC and GHG Emissions Sheet, p. 3	8.19E-04
HA	8760 MMBtu	Benzene	1.10E-05	See Process TAC and GHG Emissions Sheet, p. 2	4.80E-05
HPO	8760 MMBtu	Benzene	1.10E-05	See Process TAC and GHG Emissions Sheet, p. 2	4.80E-05
HL	8760 MMBtu	Benzene	1.10E-05	See Process TAC and GHG Emissions Sheet, p. 2	4.80E-05
HWW	8760 MMBtu	Benzene	1.10E-05	See Process TAC and GHG Emissions Sheet, p. 2	4.80E-05
HTW	17520 MMBtu	Benzene	1.10E-05	See Process TAC and GHG Emissions Sheet, p. 2	9.59E-05
HMO	8760 MMBtu	Benzene	1.10E-05	See Process TAC and GHG Emissions Sheet, p. 2	4.80E-05
UDP	22487 MMBtu	Benzene	1.36E-03	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.53E-02
EDG1	1878 MMBtu	Benzene	1.36E-03	See Process TAC and GHG Emissions Sheet, p. 6	1.28E-03
MFD	468 MMBtu	Benzene	3.21E-05	See Process TAC and GHG Emissions Sheet, p. 4	7.51E-06
EDFP	188 MMBtu	Benzene	1.36E-03	See Process TAC and GHG Emissions Sheet, p. 6	1.28E-04
TG1	120000 gal	Benzene	2.78E-04	See Tank Emission Calculations Sheet, p. 1	1.67E-02
TD1	240000 gal	Benzene	2.86E-10	See Tank Emission Calculations Sheet, p. 1	3.44E-08
TD2	15000 gal	Benzene	4.82E-10	See Tank Emission Calculations Sheet, p. 1	3.61E-09
TOTAL		**Benzene**			**4.09E-02**
HA	8760 MMBtu	Benzo[a]pyrene	9.61E-10	See Process TAC and GHG Emissions Sheet, p. 2	4.21E-09
HPO	8760 MMBtu	Benzo[a]pyrene	9.61E-10	See Process TAC and GHG Emissions Sheet, p. 2	4.21E-09
HL	8760 MMBtu	Benzo[a]pyrene	9.61E-10	See Process TAC and GHG Emissions Sheet, p. 2	4.21E-09
HWW	8760 MMBtu	Benzo[a]pyrene	9.61E-10	See Process TAC and GHG Emissions Sheet, p. 2	4.21E-09
HTW	17520 MMBtu	Benzo[a]pyrene	9.61E-10	See Process TAC and GHG Emissions Sheet, p. 2	8.42E-09
HMO	8760 MMBtu	Benzo[a]pyrene	9.61E-10	See Process TAC and GHG Emissions Sheet, p. 2	4.21E-09
UDP	22487 MMBtu	Benzo[a]pyrene	2.59E-07	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.91E-06
EDG1	1878 MMBtu	Benzo[a]pyrene	2.59E-07	See Process TAC and GHG Emissions Sheet, p. 6	2.43E-07
MFD	468 MMBtu	Benzo[a]pyrene	5.51E-08	See Process TAC and GHG Emissions Sheet, p. 4	1.29E-08
EDFP	188 MMBtu	Benzo[a]pyrene	2.59E-07	See Process TAC and GHG Emissions Sheet, p. 6	2.43E-08
TOTAL		**Benzo[a]pyrene**			**3.22E-06**
HA	8760 MMBtu	Benzo[b]fluoranthene	1.12E-09	See Process TAC and GHG Emissions Sheet, p. 2	4.90E-09
HPO	8760 MMBtu	Benzo[b]fluoranthene	1.12E-09	See Process TAC and GHG Emissions Sheet, p. 2	4.90E-09
HL	8760 MMBtu	Benzo[b]fluoranthene	1.12E-09	See Process TAC and GHG Emissions Sheet, p. 2	4.90E-09
HWW	8760 MMBtu	Benzo[b]fluoranthene	1.12E-09	See Process TAC and GHG Emissions Sheet, p. 2	4.90E-09
HTW	17520 MMBtu	Benzo[b]fluoranthene	1.12E-09	See Process TAC and GHG Emissions Sheet, p. 2	9.79E-09
HMO	8760 MMBtu	Benzo[b]fluoranthene	1.12E-09	See Process TAC and GHG Emissions Sheet, p. 2	4.90E-09
UDP	22487 MMBtu	Benzo[b]fluoranthene	4.89E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.50E-04
EDG1	1878 MMBtu	Benzo[b]fluoranthene	4.89E-05	See Process TAC and GHG Emissions Sheet, p. 6	4.59E-05
MFD	468 MMBtu	Benzo[b]fluoranthene	4.87E-08	See Process TAC and GHG Emissions Sheet, p. 4	1.14E-08
EDFP	188 MMBtu	Benzo[b]fluoranthene	4.89E-05	See Process TAC and GHG Emissions Sheet, p. 6	4.59E-06
TOTAL		**Benzo[b]fluoranthene**			**6.00E-04**
MFD	468 MMBtu	Benzo[e]pyrene	1.02E-07	p-Dichlorobenzene (1,4-Dichlorobenzene)	2.39E-08
HA	8760 MMBtu	Benzo[g,h,i]perylene	1.23E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.37E-09
HPO	8760 MMBtu	Benzo[g,h,i]perylene	1.23E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.37E-09
HL	8760 MMBtu	Benzo[g,h,i]perylene	1.23E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.37E-09

HWW	8760 MMBtu	Benzo[g,h,i]perylene	1.23E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.37E-09
HTW	17520 MMBtu	Benzo[g,h,i]perylene	1.23E-09	See Process TAC and GHG Emissions Sheet, p. 2	1.07E-08
HMO	8760 MMBtu	Benzo[g,h,i]perylene	1.23E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.37E-09
UDP	22487 MMBtu	Benzo[g,h,i]perylene	2.08E-08	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.34E-07
EDG1	1878 MMBtu	Benzo[g,h,i]perylene	2.08E-08	See Process TAC and GHG Emissions Sheet, p. 6	1.95E-08
MFD	468 MMBtu	Benzo[g,h,i]perylene	6.20E-08	See Process TAC and GHG Emissions Sheet, p. 4	1.45E-08
EDFP	188 MMBtu	Benzo[g,h,i]perylene	2.08E-08	See Process TAC and GHG Emissions Sheet, p. 6	1.95E-09
TOTAL		**Benzo[g,h,i]perylene**			**3.07E-07**
HA	8760 MMBtu	Benzo[k]fluoranthene	9.71E-10	See Process TAC and GHG Emissions Sheet, p. 2	4.25E-09
HPO	8760 MMBtu	Benzo[k]fluoranthene	9.71E-10	See Process TAC and GHG Emissions Sheet, p. 2	4.25E-09
HL	8760 MMBtu	Benzo[k]fluoranthene	9.71E-10	See Process TAC and GHG Emissions Sheet, p. 2	4.25E-09
HWW	8760 MMBtu	Benzo[k]fluoranthene	9.71E-10	See Process TAC and GHG Emissions Sheet, p. 2	4.25E-09
HTW	17520 MMBtu	Benzo[k]fluoranthene	9.71E-10	See Process TAC and GHG Emissions Sheet, p. 2	8.50E-09
HMO	8760 MMBtu	Benzo[k]fluoranthene	9.71E-10	See Process TAC and GHG Emissions Sheet, p. 2	4.25E-09
UDP	22487 MMBtu	Benzo[k]fluoranthene	4.89E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.50E-04
EDG1	1878 MMBtu	Benzo[k]fluoranthene	4.89E-05	See Process TAC and GHG Emissions Sheet, p. 6	4.59E-05
MFD	468 MMBtu	Benzo[k]fluoranthene	6.07E-07	See Process TAC and GHG Emissions Sheet, p. 4	1.42E-07
EDFP	188 MMBtu	Benzo[k]fluoranthene	4.89E-05	See Process TAC and GHG Emissions Sheet, p. 6	4.59E-06
TOTAL		**Benzo[k]fluoranthene**			**6.00E-04**
OC	297840 ton	Beryllium and compounds	6.54E-09	See Process TAC and GHG Emissions Sheet, p. 9	9.74E-07
BC	247000 ton	Beryllium and compounds	1.04E-07	See Process TAC and GHG Emissions Sheet, p. 9	1.28E-05
UBD	1234 MMBtu	Beryllium and compounds	3.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	1.85E-06
BRWBD	160 MMBtu	Beryllium and compounds	3.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	2.39E-07
HA	8760 MMBtu	Beryllium and compounds	1.18E-08	See Process TAC and GHG Emissions Sheet, p. 2	5.15E-08
HPO	8760 MMBtu	Beryllium and compounds	1.18E-08	See Process TAC and GHG Emissions Sheet, p. 2	5.15E-08
HL	8760 MMBtu	Beryllium and compounds	1.18E-08	See Process TAC and GHG Emissions Sheet, p. 2	5.15E-08
HWW	8760 MMBtu	Beryllium and compounds	1.18E-08	See Process TAC and GHG Emissions Sheet, p. 2	5.15E-08
HTW	17520 MMBtu	Beryllium and compounds	1.18E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-07
HMO	8760 MMBtu	Beryllium and compounds	1.18E-08	See Process TAC and GHG Emissions Sheet, p. 2	5.15E-08
CKD	1752 ton	Beryllium and compounds	3.27E-07	See Process TAC and GHG Emissions Sheet, p. 9	2.86E-07
MFP	468 MMBtu	Beryllium and compounds	1.19E-06	See Process TAC and GHG Emissions Sheet, p. 9	2.79E-07
UFD	291200 ton	Beryllium and compounds	1.20E-09	See Mine TAC and GHG Emissions Sheet, p. 1	1.75E-07
AFD	247000 ton	Beryllium and compounds	2.07E-08	See Mine TAC and GHG Emissions Sheet, p. 1	2.56E-06
CEM1	18742 ton	Beryllium and compounds	1.29E-08	See Process TAC and GHG Emissions Sheet, p. 12	1.21E-07
CEM2	18742 ton	Beryllium and compounds	1.29E-08	See Process TAC and GHG Emissions Sheet, p. 12	1.21E-07
CEM3	249000 ton	Beryllium and compounds	1.26E-08	See Process TAC and GHG Emissions Sheet, p. 9	1.57E-06
CEM4	249000 ton	Beryllium and compounds	8.78E-09	See Process TAC and GHG Emissions Sheet, p. 9	1.09E-06
TOTAL		**Beryllium and compounds**			**2.25E-05**
TG1	120000 gal	Biphenyl	1.54E-06	See Tank Emission Calculations Sheet, p. 1	9.26E-05
TD1	240000 gal	Biphenyl	3.41E-08	See Tank Emission Calculations Sheet, p. 1	4.09E-06
TD2	15000 gal	Biphenyl	5.73E-08	See Tank Emission Calculations Sheet, p. 1	4.30E-07
TOTAL		**Biphenyl**			**9.71E-05**
OC	297840 ton	Cadmium and compounds	1.20E-09	See Process TAC and GHG Emissions Sheet, p. 9	1.79E-07
BC	247000 ton	Cadmium and compounds	1.19E-08	See Process TAC and GHG Emissions Sheet, p. 9	1.47E-06
UBD	1234 MMBtu	Cadmium and compounds	3.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	1.85E-06
BRWBD	160 MMBtu	Cadmium and compounds	3.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	2.39E-07
HA	8760 MMBtu	Cadmium and compounds	1.08E-06	See Process TAC and GHG Emissions Sheet, p. 2	4.72E-06
HPO	8760 MMBtu	Cadmium and compounds	1.08E-06	See Process TAC and GHG Emissions Sheet, p. 2	4.72E-06
HL	8760 MMBtu	Cadmium and compounds	1.08E-06	See Process TAC and GHG Emissions Sheet, p. 2	4.72E-06
HWW	8760 MMBtu	Cadmium and compounds	1.08E-06	See Process TAC and GHG Emissions Sheet, p. 2	4.72E-06
HTW	17520 MMBtu	Cadmium and compounds	1.08E-06	See Process TAC and GHG Emissions Sheet, p. 2	9.45E-06
HMO	8760 MMBtu	Cadmium and compounds	1.08E-06	See Process TAC and GHG Emissions Sheet, p. 2	4.72E-06
CKD	1752 ton	Cadmium and compounds	6.00E-08	See Process TAC and GHG Emissions Sheet, p. 9	5.26E-08
MFP	468 MMBtu	Cadmium and compounds	2.19E-07	See Process TAC and GHG Emissions Sheet, p. 9	5.11E-08
UFD	291200 ton	Cadmium and compounds	2.07E-10	See Mine TAC and GHG Emissions Sheet, p. 1	3.02E-08
AFD	247000 ton	Cadmium and compounds	2.57E-09	See Mine TAC and GHG Emissions Sheet, p. 1	3.17E-07
CEM1	18742 ton	Cadmium and compounds	4.06E-09	See Process TAC and GHG Emissions Sheet, p. 12	3.80E-08
CEM2	18742 ton	Cadmium and compounds	4.06E-09	See Process TAC and GHG Emissions Sheet, p. 12	3.80E-08
CEM3	249000 ton	Cadmium and compounds	1.45E-09	See Process TAC and GHG Emissions Sheet, p. 9	1.80E-07
CEM4	249000 ton	Cadmium and compounds	1.01E-09	See Process TAC and GHG Emissions Sheet, p. 9	1.25E-07
CEM5	18742 ton	Cadmium and compounds	7.10E-10	See Process TAC and GHG Emissions Sheet, p. 12	6.65E-09
UDP	22487 MMBtu	Cadmium and compounds	1.09E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.23E-04
EDG1	1878 MMBtu	Cadmium and compounds	1.09E-05	See Process TAC and GHG Emissions Sheet, p. 6	1.03E-05
MFD	468 MMBtu	Cadmium and compounds	1.09E-05	See Process TAC and GHG Emissions Sheet, p. 4	2.56E-06
EDFP	188 MMBtu	Cadmium and compounds	1.09E-05	See Process TAC and GHG Emissions Sheet, p. 6	1.03E-06
TOTAL		**Cadmium and compounds**			**1.75E-04**
UDP	22487 MMBtu	Chlorobenzene	1.46E-06	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.64E-05
EDG1	1878 MMBtu	Chlorobenzene	1.46E-06	See Process TAC and GHG Emissions Sheet, p. 6	1.37E-06
MFD	468 MMBtu	Chlorobenzene	1.46E-06	See Process TAC and GHG Emissions Sheet, p. 4	3.42E-07
EDFP	188 MMBtu	Chlorobenzene	1.46E-06	See Process TAC and GHG Emissions Sheet, p. 6	1.37E-07
TOTAL		**Chlorobenzene**			**1.83E-05**
OC	297840 ton	Chromium VI, chromate, and dichromate particulate	1.67E-07	See Process TAC and GHG Emissions Sheet, p. 9	2.49E-05
BC	247000 ton	Chromium VI, chromate, and dichromate particulate	1.31E-06	See Process TAC and GHG Emissions Sheet, p. 9	1.62E-04
UBD	1234 MMBtu	Chromium VI, chromate, and dichromate particulate	3.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	1.85E-06
BRWBD	160 MMBtu	Chromium VI, chromate, and dichromate particulate	3.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	2.39E-07
HA	8760 MMBtu	Chromium VI, chromate, and dichromate particulate	1.37E-06	See Process TAC and GHG Emissions Sheet, p. 2	6.01E-06
HPO	8760 MMBtu	Chromium VI, chromate, and dichromate particulate	1.37E-06	See Process TAC and GHG Emissions Sheet, p. 2	6.01E-06
HL	8760 MMBtu	Chromium VI, chromate, and dichromate particulate	1.37E-06	See Process TAC and GHG Emissions Sheet, p. 2	6.01E-06
HWW	8760 MMBtu	Chromium VI, chromate, and dichromate particulate	1.37E-06	See Process TAC and GHG Emissions Sheet, p. 2	6.01E-06
HTW	17520 MMBtu	Chromium VI, chromate, and dichromate particulate	1.37E-06	See Process TAC and GHG Emissions Sheet, p. 2	1.20E-05
HMO	8760 MMBtu	Chromium VI, chromate, and dichromate particulate	1.37E-06	See Process TAC and GHG Emissions Sheet, p. 2	6.01E-06
CKD	1752 ton	Chromium VI, chromate, and dichromate particulate	8.36E-06	See Process TAC and GHG Emissions Sheet, p. 9	7.32E-06
MFP	468 MMBtu	Chromium VI, chromate, and dichromate particulate	3.05E-05	See Process TAC and GHG Emissions Sheet, p. 9	7.12E-06
UFD	291200 ton	Chromium VI, chromate, and dichromate particulate	2.82E-08	See Mine TAC and GHG Emissions Sheet, p. 1	4.11E-06
AFD	247000 ton	Chromium VI, chromate, and dichromate particulate	2.97E-07	See Mine TAC and GHG Emissions Sheet, p. 1	3.66E-05
CEM1	18742 ton	Chromium VI, chromate, and dichromate particulate	1.94E-07	See Process TAC and GHG Emissions Sheet, p. 12	1.82E-06
CEM2	18742 ton	Chromium VI, chromate, and dichromate particulate	1.94E-07	See Process TAC and GHG Emissions Sheet, p. 12	1.82E-06
CEM3	249000 ton	Chromium VI, chromate, and dichromate particulate	1.59E-07	See Process TAC and GHG Emissions Sheet, p. 9	1.98E-05
CEM4	249000 ton	Chromium VI, chromate, and dichromate particulate	1.11E-07	See Process TAC and GHG Emissions Sheet, p. 9	1.38E-05
CEM5	18742 ton	Chromium VI, chromate, and dichromate particulate	1.27E-07	See Process TAC and GHG Emissions Sheet, p. 12	1.19E-06
UDP	22487 MMBtu	Chromium VI, chromate, and dichromate particulate	7.30E-07	See Nonroad TAC and GHG Emissions Sheet, p. 2	8.21E-06
EDG1	1878 MMBtu	Chromium VI, chromate, and dichromate particulate	7.30E-07	See Process TAC and GHG Emissions Sheet, p. 6	6.85E-07
MFD	468 MMBtu	Chromium VI, chromate, and dichromate particulate	7.30E-07	See Process TAC and GHG Emissions Sheet, p. 4	1.71E-07
EDFP	188 MMBtu	Chromium VI, chromate, and dichromate particulate	7.30E-07	See Process TAC and GHG Emissions Sheet, p. 6	6.85E-08
TOTAL		**Chromium VI, chromate, and dichromate particulate**			**3.34E-04**
HA	8760 MMBtu	Chrysene	1.36E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.97E-09
HPO	8760 MMBtu	Chrysene	1.36E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.97E-09
HL	8760 MMBtu	Chrysene	1.36E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.97E-09
HWW	8760 MMBtu	Chrysene	1.36E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.97E-09
HTW	17520 MMBtu	Chrysene	1.36E-09	See Process TAC and GHG Emissions Sheet, p. 2	1.19E-08
HMO	8760 MMBtu	Chrysene	1.36E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.97E-09
UDP	22487 MMBtu	Chrysene	2.61E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.94E-04
EDG1	1878 MMBtu	Chrysene	2.61E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.45E-05
MFD	468 MMBtu	Chrysene	9.34E-08	See Process TAC and GHG Emissions Sheet, p. 4	2.19E-08
EDFP	188 MMBtu	Chrysene	2.61E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.45E-06
TOTAL		**Chrysene**			**3.21E-04**
OC	297840 ton	Cobalt and compounds	8.52E-09	See Process TAC and GHG Emissions Sheet, p. 9	1.27E-06
BC	247000 ton	Cobalt and compounds	1.58E-07	See Process TAC and GHG Emissions Sheet, p. 9	1.95E-05

HA	8760 MMBtu	Cobalt and compounds	8.24E-08	See Process TAC and GHG Emissions Sheet, p. 2	3.61E-07
HPO	8760 MMBtu	Cobalt and compounds	8.24E-08	See Process TAC and GHG Emissions Sheet, p. 2	3.61E-07
HL	8760 MMBtu	Cobalt and compounds	8.24E-08	See Process TAC and GHG Emissions Sheet, p. 2	3.61E-07
HWW	8760 MMBtu	Cobalt and compounds	8.24E-08	See Process TAC and GHG Emissions Sheet, p. 2	3.61E-07
HTW	17520 MMBtu	Cobalt and compounds	8.24E-08	See Process TAC and GHG Emissions Sheet, p. 2	7.21E-07
HMO	8760 MMBtu	Cobalt and compounds	8.24E-08	See Process TAC and GHG Emissions Sheet, p. 2	3.61E-07
CKD	1752 ton	Cobalt and compounds	4.26E-07	See Process TAC and GHG Emissions Sheet, p. 9	3.73E-07
MFP	468 MMBtu	Cobalt and compounds	1.55E-06	See Process TAC and GHG Emissions Sheet, p. 9	3.63E-07
UFD	291200 ton	Cobalt and compounds	1.61E-09	See Mine TAC and GHG Emissions Sheet, p. 1	2.34E-07
AFD	247000 ton	Cobalt and compounds	3.09E-08	See Mine TAC and GHG Emissions Sheet, p. 1	3.82E-06
CEM3	249000 ton	Cobalt and compounds	1.92E-08	See Process TAC and GHG Emissions Sheet, p. 9	2.39E-06
CEM4	249000 ton	Cobalt and compounds	1.33E-08	See Process TAC and GHG Emissions Sheet, p. 9	1.66E-06
TOTAL		**Cobalt and compounds**			**3.21E-05**
OC	297840 ton	Copper and compounds	1.07E-07	See Process TAC and GHG Emissions Sheet, p. 9	1.59E-05
BC	247000 ton	Copper and compounds	5.61E-07	See Process TAC and GHG Emissions Sheet, p. 9	6.93E-05
UBD	1234 MMBtu	Copper and compounds	6.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	3.70E-06
BRWBD	160 MMBtu	Copper and compounds	6.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	4.77E-07
HA	8760 MMBtu	Copper and compounds	8.33E-07	See Process TAC and GHG Emissions Sheet, p. 2	3.65E-06
HPO	8760 MMBtu	Copper and compounds	8.33E-07	See Process TAC and GHG Emissions Sheet, p. 2	3.65E-06
HL	8760 MMBtu	Copper and compounds	8.33E-07	See Process TAC and GHG Emissions Sheet, p. 2	3.65E-06
HWW	8760 MMBtu	Copper and compounds	8.33E-07	See Process TAC and GHG Emissions Sheet, p. 2	3.65E-06
HTW	17520 MMBtu	Copper and compounds	8.33E-07	See Process TAC and GHG Emissions Sheet, p. 2	7.30E-06
HMO	8760 MMBtu	Copper and compounds	8.33E-07	See Process TAC and GHG Emissions Sheet, p. 2	3.65E-06
CKD	1752 ton	Copper and compounds	5.34E-06	See Process TAC and GHG Emissions Sheet, p. 9	4.68E-06
MFP	468 MMBtu	Copper and compounds	1.95E-05	See Process TAC and GHG Emissions Sheet, p. 9	4.55E-06
UFD	291200 ton	Copper and compounds	1.75E-08	See Mine TAC and GHG Emissions Sheet, p. 1	2.55E-06
AFD	247000 ton	Copper and compounds	1.42E-07	See Mine TAC and GHG Emissions Sheet, p. 1	1.75E-05
CEM3	249000 ton	Copper and compounds	6.82E-08	See Process TAC and GHG Emissions Sheet, p. 9	8.49E-06
CEM4	249000 ton	Copper and compounds	4.74E-08	See Process TAC and GHG Emissions Sheet, p. 9	5.90E-06
UDP	22487 MMBtu	Copper and compounds	2.99E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.36E-04
EDG1	1878 MMBtu	Copper and compounds	2.99E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.81E-05
MFD	468 MMBtu	Copper and compounds	2.99E-05	See Process TAC and GHG Emissions Sheet, p. 4	7.00E-06
EDFP	188 MMBtu	Copper and compounds	2.99E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.81E-06
TOTAL		**Copper and compounds**			**5.33E-04**
EW	8760 Hours of operation	Cyanide, Hydrogen	4.57E-03	See HCN Monthly Sheet	2.00E-02
TSF	8760 Hours of operation	Cyanide, Hydrogen	1.44E-01	See HCN Monthly Sheet	6.31E-01
POND	8760 Hours of operation	Cyanide, Hydrogen	2.95E-02	See HCN Monthly Sheet	1.29E-01
LEACH1	8760 Hours of operation	Cyanide, Hydrogen	4.78E-02	See HCN Monthly Sheet	2.09E-01
LEACH2	8760 Hours of operation	Cyanide, Hydrogen	4.78E-02	See HCN Monthly Sheet	2.09E-01
CILTANK1	8760 Hours of operation	Cyanide, Hydrogen	2.39E-02	See HCN Monthly Sheet	1.05E-01
CILTANK2	8760 Hours of operation	Cyanide, Hydrogen	2.39E-02	See HCN Monthly Sheet	1.05E-01
CILTANK3	8760 Hours of operation	Cyanide, Hydrogen	2.39E-02	See HCN Monthly Sheet	1.05E-01
CILTANK4	8760 Hours of operation	Cyanide, Hydrogen	2.39E-02	See HCN Monthly Sheet	1.05E-01
CILTANK5	8760 Hours of operation	Cyanide, Hydrogen	2.39E-02	See HCN Monthly Sheet	1.05E-01
CILTANK6	8760 Hours of operation	Cyanide, Hydrogen	2.39E-02	See HCN Monthly Sheet	1.05E-01
CILTANK7	8760 Hours of operation	Cyanide, Hydrogen	2.39E-02	See HCN Monthly Sheet	1.05E-01
TOTAL		**Cyanide, Hydrogen**			**1.93E+00**
TG1	120000 gal	Cyclohexane	3.70E-05	See Tank Emission Calculations Sheet, p. 1	2.22E-03
HA	8760 MMBtu	Dibenz[a,h]anthracene	8.99E-10	See Process TAC and GHG Emissions Sheet, p. 2	3.94E-09
HPO	8760 MMBtu	Dibenz[a,h]anthracene	8.99E-10	See Process TAC and GHG Emissions Sheet, p. 2	3.94E-09
HL	8760 MMBtu	Dibenz[a,h]anthracene	8.99E-10	See Process TAC and GHG Emissions Sheet, p. 2	3.94E-09
HWW	8760 MMBtu	Dibenz[a,h]anthracene	8.99E-10	See Process TAC and GHG Emissions Sheet, p. 2	3.94E-09
HTW	17520 MMBtu	Dibenz[a,h]anthracene	8.99E-10	See Process TAC and GHG Emissions Sheet, p. 2	7.88E-09
HMO	8760 MMBtu	Dibenz[a,h]anthracene	8.99E-10	See Process TAC and GHG Emissions Sheet, p. 2	3.94E-09
UDP	22487 MMBtu	Dibenz[a,h]anthracene	2.55E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.87E-04
EDG1	1878 MMBtu	Dibenz[a,h]anthracene	2.55E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.39E-05
MFD	468 MMBtu	Dibenz[a,h]anthracene	4.74E-08	See Process TAC and GHG Emissions Sheet, p. 4	1.11E-08
EDFP	188 MMBtu	Dibenz[a,h]anthracene	2.55E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.39E-06
TOTAL		**Dibenz[a,h]anthracene**			**3.13E-04**
UDP	22487 MMBtu	Diesel Particulate Matter	2.45E-01	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.75E+00
EDG1	1878 MMBtu	Diesel Particulate Matter	8.98E-01	See Process TAC and GHG Emissions Sheet, p. 6	8.43E-01
EDFP	188 MMBtu	Diesel Particulate Matter	8.98E-01	See Process TAC and GHG Emissions Sheet, p. 6	8.43E-02
TOTAL		**Diesel Particulate Matter**			**3.68E+00**
UB	530 ton	Ethyl benzene	2.40E-04	See Mine TAC and GHG Emissions Sheet, p. 3	6.35E-05
BRWB	69 ton	Ethyl benzene	2.40E-04	See Mine TAC and GHG Emissions Sheet, p. 3	8.19E-06
HA	8760 MMBtu	Ethyl benzene	9.31E-06	See Process TAC and GHG Emissions Sheet, p. 2	4.08E-05
HPO	8760 MMBtu	Ethyl benzene	9.31E-06	See Process TAC and GHG Emissions Sheet, p. 2	4.08E-05
HL	8760 MMBtu	Ethyl benzene	9.31E-06	See Process TAC and GHG Emissions Sheet, p. 2	4.08E-05
HWW	8760 MMBtu	Ethyl benzene	9.31E-06	See Process TAC and GHG Emissions Sheet, p. 2	4.08E-05
HTW	17520 MMBtu	Ethyl benzene	9.31E-06	See Process TAC and GHG Emissions Sheet, p. 2	8.16E-05
HMO	8760 MMBtu	Ethyl benzene	9.31E-06	See Process TAC and GHG Emissions Sheet, p. 2	4.08E-05
UDP	22487 MMBtu	Ethyl benzene	7.96E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	8.95E-04
EDG1	1878 MMBtu	Ethyl benzene	7.96E-05	See Process TAC and GHG Emissions Sheet, p. 6	7.47E-05
MFD	468 MMBtu	Ethyl benzene	1.46E-06	See Process TAC and GHG Emissions Sheet, p. 4	3.42E-07
EDFP	188 MMBtu	Ethyl benzene	7.96E-05	See Process TAC and GHG Emissions Sheet, p. 6	7.47E-06
TG1	120000 gal	Ethyl benzene	2.48E-04	See Tank Emission Calculations Sheet, p. 1	1.49E-02
TD1	240000 gal	Ethyl benzene	4.43E-09	See Tank Emission Calculations Sheet, p. 1	5.32E-07
TD2	15000 gal	Ethyl benzene	7.45E-09	See Tank Emission Calculations Sheet, p. 1	5.59E-08
TOTAL		**Ethyl benzene**			**1.62E-02**
HA	8760 MMBtu	Fluoranthene	1.17E-08	See Process TAC and GHG Emissions Sheet, p. 2	5.11E-08
HPO	8760 MMBtu	Fluoranthene	1.17E-08	See Process TAC and GHG Emissions Sheet, p. 2	5.11E-08
HL	8760 MMBtu	Fluoranthene	1.17E-08	See Process TAC and GHG Emissions Sheet, p. 2	5.11E-08
HWW	8760 MMBtu	Fluoranthene	1.17E-08	See Process TAC and GHG Emissions Sheet, p. 2	5.11E-08
HTW	17520 MMBtu	Fluoranthene	1.17E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.02E-07
HMO	8760 MMBtu	Fluoranthene	1.17E-08	See Process TAC and GHG Emissions Sheet, p. 2	5.11E-08
UDP	22487 MMBtu	Fluoranthene	2.92E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.28E-04
EDG1	1878 MMBtu	Fluoranthene	2.92E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.74E-05
MFD	468 MMBtu	Fluoranthene	2.42E-07	See Process TAC and GHG Emissions Sheet, p. 4	5.67E-08
EDFP	188 MMBtu	Fluoranthene	2.92E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.74E-06
TOTAL		**Fluoranthene**			**3.59E-04**
HA	8760 MMBtu	Fluorene	4.50E-09	See Process TAC and GHG Emissions Sheet, p. 2	1.97E-08
HPO	8760 MMBtu	Fluorene	4.50E-09	See Process TAC and GHG Emissions Sheet, p. 2	1.97E-08
HL	8760 MMBtu	Fluorene	4.50E-09	See Process TAC and GHG Emissions Sheet, p. 2	1.97E-08
HWW	8760 MMBtu	Fluorene	4.50E-09	See Process TAC and GHG Emissions Sheet, p. 2	1.97E-08
HTW	17520 MMBtu	Fluorene	4.50E-09	See Process TAC and GHG Emissions Sheet, p. 2	3.94E-08
HMO	8760 MMBtu	Fluorene	4.50E-09	See Process TAC and GHG Emissions Sheet, p. 2	1.97E-08
UDP	22487 MMBtu	Fluorene	1.54E-04	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.73E-03
EDG1	1878 MMBtu	Fluorene	1.54E-04	See Process TAC and GHG Emissions Sheet, p. 6	1.45E-04
MFD	468 MMBtu	Fluorene	8.54E-07	See Process TAC and GHG Emissions Sheet, p. 4	2.00E-07
EDFP	188 MMBtu	Fluorene	1.54E-04	See Process TAC and GHG Emissions Sheet, p. 6	1.45E-05
TOTAL		**Fluorene**			**1.89E-03**
HA	8760 MMBtu	Formaldehyde	7.26E-05	See Process TAC and GHG Emissions Sheet, p. 2	3.18E-04
HPO	8760 MMBtu	Formaldehyde	7.26E-05	See Process TAC and GHG Emissions Sheet, p. 2	3.18E-04
HL	8760 MMBtu	Formaldehyde	7.26E-05	See Process TAC and GHG Emissions Sheet, p. 2	3.18E-04
HWW	8760 MMBtu	Formaldehyde	7.26E-05	See Process TAC and GHG Emissions Sheet, p. 2	3.18E-04
HTW	17520 MMBtu	Formaldehyde	7.26E-05	See Process TAC and GHG Emissions Sheet, p. 2	6.36E-04
HMO	8760 MMBtu	Formaldehyde	7.26E-05	See Process TAC and GHG Emissions Sheet, p. 2	3.18E-04
UDP	22487 MMBtu	Formaldehyde	1.26E-02	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.42E-01

EDG1	1878 MMBtu	Formaldehyde	1.26E-02	See Process TAC and GHG Emissions Sheet, p. 6	1.18E-02
MFD	468 MMBtu	Formaldehyde	2.56E-03	See Process TAC and GHG Emissions Sheet, p. 4	5.99E-04
EDFP	188 MMBtu	Formaldehyde	1.26E-02	See Process TAC and GHG Emissions Sheet, p. 6	1.18E-03
TOTAL		**Formaldehyde**			**1.57E-01**
HA	8760 MMBtu	Hexane	1.76E-03	See Process TAC and GHG Emissions Sheet, p. 2	7.73E-03
HPO	8760 MMBtu	Hexane	1.76E-03	See Process TAC and GHG Emissions Sheet, p. 2	7.73E-03
HL	8760 MMBtu	Hexane	1.76E-03	See Process TAC and GHG Emissions Sheet, p. 2	7.73E-03
HWW	8760 MMBtu	Hexane	1.76E-03	See Process TAC and GHG Emissions Sheet, p. 2	7.73E-03
HTW	17520 MMBtu	Hexane	1.76E-03	See Process TAC and GHG Emissions Sheet, p. 2	1.55E-02
HMO	8760 MMBtu	Hexane	1.76E-03	See Process TAC and GHG Emissions Sheet, p. 2	7.73E-03
UDP	22487 MMBtu	Hexane	1.96E-04	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.21E-03
EDG1	1878 MMBtu	Hexane	1.96E-04	See Process TAC and GHG Emissions Sheet, p. 6	1.84E-04
MFD	468 MMBtu	Hexane	2.55E-05	See Process TAC and GHG Emissions Sheet, p. 4	5.98E-06
EDFP	188 MMBtu	Hexane	1.96E-04	See Process TAC and GHG Emissions Sheet, p. 6	1.84E-05
TG1	120000 gal	Hexane	1.10E-03	See Tank Emission Calculations Sheet, p. 1	6.61E-02
TD1	240000 gal	Hexane	3.41E-07	See Tank Emission Calculations Sheet, p. 1	4.09E-05
TD2	15000 gal	Hexane	5.73E-07	See Tank Emission Calculations Sheet, p. 1	4.30E-06
TOTAL		**Hexane**			**1.23E-01**
UDP	22487 MMBtu	Hydrochloric Acid	1.36E-03	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.53E-02
EDG1	1878 MMBtu	Hydrochloric acid	1.36E-03	See Process TAC and GHG Emissions Sheet, p. 6	1.28E-03
MFD	468 MMBtu	Hydrochloric Acid	1.36E-03	See Process TAC and GHG Emissions Sheet, p. 4	3.18E-04
EDFP	188 MMBtu	Hydrochloric acid	1.36E-03	See Process TAC and GHG Emissions Sheet, p. 6	1.28E-04
TOTAL		**Hydrochloric acid**			**1.70E-02**
HA	8760 MMBtu	Indeno[1,2,3-cd]pyrene	1.15E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.02E-09
HPO	8760 MMBtu	Indeno[1,2,3-cd]pyrene	1.15E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.02E-09
HL	8760 MMBtu	Indeno[1,2,3-cd]pyrene	1.15E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.02E-09
HWW	8760 MMBtu	Indeno[1,2,3-cd]pyrene	1.15E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.02E-09
HTW	17520 MMBtu	Indeno[1,2,3-cd]pyrene	1.15E-09	See Process TAC and GHG Emissions Sheet, p. 2	1.00E-08
HMO	8760 MMBtu	Indeno[1,2,3-cd]pyrene	1.15E-09	See Process TAC and GHG Emissions Sheet, p. 2	5.02E-09
UDP	22487 MMBtu	Indeno[1,2,3-cd]pyrene	2.53E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.84E-04
EDG1	1878 MMBtu	Indeno[1,2,3-cd]pyrene	2.53E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.37E-05
MFD	468 MMBtu	Indeno[1,2,3-cd]pyrene	4.85E-08	See Process TAC and GHG Emissions Sheet, p. 4	1.13E-08
EDFP	188 MMBtu	Indeno[1,2,3-cd]pyrene	2.53E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.37E-06
TOTAL		**Indeno[1,2,3-cd]pyrene**			**3.10E-04**
UB	530 ton	Isopropyl alcohol	2.60E-03	See Mine TAC and GHG Emissions Sheet, p. 3	6.88E-04
BRWB	69 ton	Isopropyl alcohol	2.60E-03	See Mine TAC and GHG Emissions Sheet, p. 3	8.87E-05
TOTAL		**Isopropyl alcohol**			**7.76E-04**
TG1	120000 gal	Isopropylbenzene (Cumene)	7.72E-05	See Tank Emission Calculations Sheet, p. 1	4.63E-03
OC	297840 ton	Lead and compounds	3.87E-08	See Process TAC and GHG Emissions Sheet, p. 9	5.76E-06
BC	247000 ton	Lead and compounds	4.73E-07	See Process TAC and GHG Emissions Sheet, p. 9	5.84E-05
UBD	1234 MMBtu	Lead and compounds	9.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	5.55E-06
BRWBD	160 MMBtu	Lead and compounds	9.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	7.16E-07
CKD	1752 ton	Lead and compounds	1.94E-06	See Process TAC and GHG Emissions Sheet, p. 9	1.70E-06
MFP	468 MMBtu	Lead and compounds	7.05E-06	See Process TAC and GHG Emissions Sheet, p. 9	1.65E-06
UFD	291200 ton	Lead and compounds	6.84E-09	See Mine TAC and GHG Emissions Sheet, p. 1	9.97E-07
AFD	247000 ton	Lead and compounds	9.80E-08	See Mine TAC and GHG Emissions Sheet, p. 1	1.21E-05
CEM1	18742 ton	Lead and compounds	8.15E-08	See Process TAC and GHG Emissions Sheet, p. 12	7.63E-07
CEM2	18742 ton	Lead and compounds	8.15E-08	See Process TAC and GHG Emissions Sheet, p. 12	7.63E-07
CEM3	249000 ton	Lead and compounds	5.74E-08	See Process TAC and GHG Emissions Sheet, p. 9	7.15E-06
CEM4	249000 ton	Lead and compounds	3.99E-08	See Process TAC and GHG Emissions Sheet, p. 9	4.97E-06
CEM5	18742 ton	Lead and compounds	3.66E-08	See Process TAC and GHG Emissions Sheet, p. 12	3.43E-07
UDP	22487 MMBtu	Lead and compounds	6.06E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.81E-04
EDG1	1878 MMBtu	Lead and compounds	6.06E-05	See Process TAC and GHG Emissions Sheet, p. 6	5.69E-05
MFD	468 MMBtu	Lead and compounds	6.06E-05	See Process TAC and GHG Emissions Sheet, p. 4	1.42E-05
EDFP	188 MMBtu	Lead and compounds	6.06E-05	See Process TAC and GHG Emissions Sheet, p. 6	5.69E-06
TOTAL		**Lead and compounds**			**8.59E-04**
OC	297840 ton	Manganese and compounds	4.55E-07	See Process TAC and GHG Emissions Sheet, p. 9	6.78E-05
BC	247000 ton	Manganese and compounds	5.55E-06	See Process TAC and GHG Emissions Sheet, p. 9	6.85E-04
UBD	1234 MMBtu	Manganese and compounds	6.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	3.70E-06
BRWBD	160 MMBtu	Manganese and compounds	6.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	4.77E-07
HA	8760 MMBtu	Manganese and compounds	3.73E-07	See Process TAC and GHG Emissions Sheet, p. 2	1.63E-06
HPO	8760 MMBtu	Manganese and compounds	3.73E-07	See Process TAC and GHG Emissions Sheet, p. 2	1.63E-06
HL	8760 MMBtu	Manganese and compounds	3.73E-07	See Process TAC and GHG Emissions Sheet, p. 2	1.63E-06
HWW	8760 MMBtu	Manganese and compounds	3.73E-07	See Process TAC and GHG Emissions Sheet, p. 2	1.63E-06
HTW	17520 MMBtu	Manganese and compounds	3.73E-07	See Process TAC and GHG Emissions Sheet, p. 2	3.26E-06
HMO	8760 MMBtu	Manganese and compounds	3.73E-07	See Process TAC and GHG Emissions Sheet, p. 2	1.63E-06
CKD	1752 ton	Manganese and compounds	2.28E-05	See Process TAC and GHG Emissions Sheet, p. 9	1.99E-05
MFP	468 MMBtu	Manganese and compounds	8.29E-05	See Process TAC and GHG Emissions Sheet, p. 9	1.94E-05
UFD	291200 ton	Manganese and compounds	8.05E-08	See Mine TAC and GHG Emissions Sheet, p. 1	1.17E-05
AFD	247000 ton	Manganese and compounds	1.15E-06	See Mine TAC and GHG Emissions Sheet, p. 1	1.42E-04
CEM1	18742 ton	Manganese and compounds	1.36E-07	See Process TAC and GHG Emissions Sheet, p. 12	1.28E-06
CEM2	18742 ton	Manganese and compounds	1.36E-07	See Process TAC and GHG Emissions Sheet, p. 12	1.28E-06
CEM3	249000 ton	Manganese and compounds	6.74E-07	See Process TAC and GHG Emissions Sheet, p. 9	8.39E-05
CEM4	249000 ton	Manganese and compounds	4.69E-07	See Process TAC and GHG Emissions Sheet, p. 9	5.84E-05
CEM5	18742 ton	Manganese and compounds	3.78E-06	See Process TAC and GHG Emissions Sheet, p. 12	3.54E-05
UDP	22487 MMBtu	Manganese and compounds	2.26E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.54E-04
EDG1	1878 MMBtu	Manganese and compounds	2.26E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.12E-05
MFD	468 MMBtu	Manganese and compounds	2.26E-05	See Process TAC and GHG Emissions Sheet, p. 4	5.29E-06
EDFP	188 MMBtu	Manganese and compounds	2.26E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.12E-06
TOTAL		**Manganese and compounds**			**1.43E-03**
OC	297840 ton	Mercury and compounds	1.34E-08	See Process TAC and GHG Emissions Sheet, p. 9	2.00E-06
BC	247000 ton	Mercury and compounds	1.38E-07	See Process TAC and GHG Emissions Sheet, p. 9	1.70E-05
UBD	1234 MMBtu	Mercury and compounds	3.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	1.85E-06
BRWBD	160 MMBtu	Mercury and compounds	3.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	2.39E-07
HA	8760 MMBtu	Mercury and compounds	2.55E-07	See Process TAC and GHG Emissions Sheet, p. 2	1.12E-06
HPO	8760 MMBtu	Mercury and compounds	2.55E-07	See Process TAC and GHG Emissions Sheet, p. 2	1.12E-06
HL	8760 MMBtu	Mercury and compounds	2.55E-07	See Process TAC and GHG Emissions Sheet, p. 2	1.12E-06
HWW	8760 MMBtu	Mercury and compounds	2.55E-07	See Process TAC and GHG Emissions Sheet, p. 2	1.12E-06
HTW	17520 MMBtu	Mercury and compounds	2.55E-07	See Process TAC and GHG Emissions Sheet, p. 2	2.23E-06
HMO	8760 MMBtu	Mercury and compounds	2.55E-07	See Process TAC and GHG Emissions Sheet, p. 2	1.12E-06
CKD	1752 ton	Mercury and compounds	2.37E-04	See Process TAC and GHG Emissions Sheet, p. 11	1.04E-03
EW	8760 Hours of operation	Mercury and compounds	5.77E-04	See Process TAC and GHG Emissions Sheet, p. 11	2.53E-03
MR	8760 Hours of operation	Mercury and compounds	2.68E-05	See Process TAC and GHG Emissions Sheet, p. 11	1.17E-04
MFHG	1780 Hours of operation	Mercury and compounds	1.33E-03	See Process TAC and GHG Emissions Sheet, p. 11	5.18E-04
UFD	291200 ton	Mercury and compounds	2.33E-09	See Mine TAC and GHG Emissions Sheet, p. 1	3.39E-07
AFD	247000 ton	Mercury and compounds	2.95E-08	See Mine TAC and GHG Emissions Sheet, p. 1	3.65E-06
CEM3	249000 ton	Mercury and compounds	1.68E-08	See Process TAC and GHG Emissions Sheet, p. 9	2.09E-06
CEM4	249000 ton	Mercury and compounds	1.17E-08	See Process TAC and GHG Emissions Sheet, p. 9	1.45E-06
UDP	22487 MMBtu	Mercury and compounds	1.46E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.64E-04
EDG1	1878 MMBtu	Mercury and compounds	1.46E-05	See Process TAC and GHG Emissions Sheet, p. 6	1.37E-05
MFD	468 MMBtu	Mercury and compounds	1.46E-05	See Process TAC and GHG Emissions Sheet, p. 4	3.42E-06
EDFP	188 MMBtu	Mercury and compounds	1.46E-05	See Process TAC and GHG Emissions Sheet, p. 6	1.37E-06
TD1	240000 gal	Mercury and compounds	1.36E-11	See Tank Emission Calculations Sheet, p. 1	1.64E-09
TD2	15000 gal	Mercury and compounds	2.29E-11	See Tank Emission Calculations Sheet, p. 1	1.72E-10
TOTAL		**Mercury and compounds**			**4.42E-03**
OC	297840 ton	Molybdenum trioxide	5.27E-08	See Process TAC and GHG Emissions Sheet, p. 9	7.85E-06
BC	247000 ton	Molybdenum trioxide	3.80E-07	See Process TAC and GHG Emissions Sheet, p. 9	4.69E-05
CKD	1752 ton	Molybdenum trioxide	2.64E-06	See Process TAC and GHG Emissions Sheet, p. 9	2.31E-06

MFP	468 MMBtu	Molybdenum trioxide	9.61E-06	See Process TAC and GHG Emissions Sheet, p. 9	2.25E-06
UFD	291200 ton	Molybdenum trioxide	8.84E-09	See Mine TAC and GHG Emissions Sheet, p. 1	1.29E-06
AFD	247000 ton	Molybdenum trioxide	8.78E-08	See Mine TAC and GHG Emissions Sheet, p. 1	1.08E-05
CEM3	249000 ton	Molybdenum trioxide	4.62E-08	See Process TAC and GHG Emissions Sheet, p. 9	5.75E-06
CEM4	249000 ton	Molybdenum trioxide	3.21E-08	See Process TAC and GHG Emissions Sheet, p. 9	4.00E-06
TOTAL		**Molybdenum trioxide**			**8.12E-05**
UB	530 ton	Naphthalene	3.80E-03	See Mine TAC and GHG Emissions Sheet, p. 3	1.01E-03
BRWB	69 ton	Naphthalene	3.80E-03	See Mine TAC and GHG Emissions Sheet, p. 3	1.30E-04
HA	8760 MMBtu	Naphthalene	1.09E-06	See Process TAC and GHG Emissions Sheet, p. 2	4.79E-06
HPO	8760 MMBtu	Naphthalene	1.09E-06	See Process TAC and GHG Emissions Sheet, p. 2	4.79E-06
HL	8760 MMBtu	Naphthalene	1.09E-06	See Process TAC and GHG Emissions Sheet, p. 2	4.79E-06
HWW	8760 MMBtu	Naphthalene	1.09E-06	See Process TAC and GHG Emissions Sheet, p. 2	4.79E-06
HTW	17520 MMBtu	Naphthalene	1.09E-06	See Process TAC and GHG Emissions Sheet, p. 2	9.58E-06
HMO	8760 MMBtu	Naphthalene	1.09E-06	See Process TAC and GHG Emissions Sheet, p. 2	4.79E-06
UDP	22487 MMBtu	Naphthalene	1.44E-04	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.62E-03
EDG1	1878 MMBtu	Naphthalene	1.44E-04	See Process TAC and GHG Emissions Sheet, p. 6	1.35E-04
MFD	468 MMBtu	Naphthalene	3.87E-05	See Process TAC and GHG Emissions Sheet, p. 4	9.05E-06
EDFP	188 MMBtu	Naphthalene	1.44E-04	See Process TAC and GHG Emissions Sheet, p. 6	1.35E-05
TG1	120000 gal	Naphthalene	6.85E-05	See Tank Emission Calculations Sheet, p. 1	4.11E-03
TD1	240000 gal	Naphthalene	1.87E-07	See Tank Emission Calculations Sheet, p. 1	2.25E-05
TD2	15000 gal	Naphthalene	3.15E-07	See Tank Emission Calculations Sheet, p. 1	2.37E-06
TOTAL		**Naphthalene**			**7.08E-03**
OC	297840 ton	Nickel compounds, insoluble	2.77E-08	See Process TAC and GHG Emissions Sheet, p. 9	4.13E-06
BC	247000 ton	Nickel compounds, insoluble	2.56E-07	See Process TAC and GHG Emissions Sheet, p. 9	3.16E-05
UBD	1234 MMBtu	Nickel compounds, insoluble	3.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	1.85E-06
BRWBD	160 MMBtu	Nickel compounds, insoluble	3.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	2.39E-07
HA	8760 MMBtu	Nickel compounds, insoluble	2.06E-06	See Process TAC and GHG Emissions Sheet, p. 2	9.02E-06
HPO	8760 MMBtu	Nickel compounds, insoluble	2.06E-06	See Process TAC and GHG Emissions Sheet, p. 2	9.02E-06
HL	8760 MMBtu	Nickel compounds, insoluble	2.06E-06	See Process TAC and GHG Emissions Sheet, p. 2	9.02E-06
HWW	8760 MMBtu	Nickel compounds, insoluble	2.06E-06	See Process TAC and GHG Emissions Sheet, p. 2	9.02E-06
HTW	17520 MMBtu	Nickel compounds, insoluble	2.06E-06	See Process TAC and GHG Emissions Sheet, p. 2	1.80E-05
HMO	8760 MMBtu	Nickel compounds, insoluble	2.06E-06	See Process TAC and GHG Emissions Sheet, p. 2	9.02E-06
CKD	1752 ton	Nickel compounds, insoluble	1.39E-06	See Process TAC and GHG Emissions Sheet, p. 9	1.21E-06
MFP	468 MMBtu	Nickel compounds, insoluble	5.05E-06	See Process TAC and GHG Emissions Sheet, p. 9	1.18E-06
UFD	291200 ton	Nickel compounds, insoluble	4.75E-09	See Mine TAC and GHG Emissions Sheet, p. 1	6.92E-07
AFD	247000 ton	Nickel compounds, insoluble	5.59E-08	See Mine TAC and GHG Emissions Sheet, p. 1	6.91E-06
CEM1	18742 ton	Nickel compounds, insoluble	3.52E-07	See Process TAC and GHG Emissions Sheet, p. 12	3.30E-06
CEM2	18742 ton	Nickel compounds, insoluble	3.52E-07	See Process TAC and GHG Emissions Sheet, p. 12	3.30E-06
CEM3	249000 ton	Nickel compounds, insoluble	3.11E-08	See Process TAC and GHG Emissions Sheet, p. 9	3.87E-06
CEM4	249000 ton	Nickel compounds, insoluble	2.16E-08	See Process TAC and GHG Emissions Sheet, p. 9	2.70E-06
CEM5	18742 ton	Nickel compounds, insoluble	2.48E-07	See Process TAC and GHG Emissions Sheet, p. 12	2.32E-06
UDP	22487 MMBtu	Nickel compounds, insoluble	2.85E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.20E-04
EDG1	1878 MMBtu	Nickel compounds, insoluble	2.85E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.67E-05
MFD	468 MMBtu	Nickel compounds, insoluble	2.85E-05	See Process TAC and GHG Emissions Sheet, p. 4	6.66E-06
EDFP	188 MMBtu	Nickel compounds, insoluble	2.85E-05	See Process TAC and GHG Emissions Sheet, p. 6	2.67E-06
TOTAL		**Nickel compounds, insoluble**			**4.83E-04**
HA	8760 MMBtu	p-Dichlorobenzene (1,4-Dichlorobenzene)	1.18E-06	See Process TAC and GHG Emissions Sheet, p. 2	5.15E-06
HPO	8760 MMBtu	p-Dichlorobenzene (1,4-Dichlorobenzene)	1.18E-06	See Process TAC and GHG Emissions Sheet, p. 2	5.15E-06
HL	8760 MMBtu	p-Dichlorobenzene (1,4-Dichlorobenzene)	1.18E-06	See Process TAC and GHG Emissions Sheet, p. 2	5.15E-06
HWW	8760 MMBtu	p-Dichlorobenzene (1,4-Dichlorobenzene)	1.18E-06	See Process TAC and GHG Emissions Sheet, p. 2	5.15E-06
HTW	17520 MMBtu	p-Dichlorobenzene (1,4-Dichlorobenzene)	1.18E-06	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-05
HMO	8760 MMBtu	p-Dichlorobenzene (1,4-Dichlorobenzene)	1.18E-06	See Process TAC and GHG Emissions Sheet, p. 2	5.15E-06
TOTAL		**p-Dichlorobenzene (1,4-Dichlorobenzene)**			**3.61E-05**
MFD	468 MMBtu	Perylene	1.98E-07	See Process TAC and GHG Emissions Sheet, p. 4	4.63E-08
HA	8760 MMBtu	Phenanthrene	3.30E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.45E-07
HPO	8760 MMBtu	Phenanthrene	3.30E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.45E-07
HL	8760 MMBtu	Phenanthrene	3.30E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.45E-07
HWW	8760 MMBtu	Phenanthrene	3.30E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.45E-07
HTW	17520 MMBtu	Phenanthrene	3.30E-08	See Process TAC and GHG Emissions Sheet, p. 2	2.89E-07
HMO	8760 MMBtu	Phenanthrene	3.30E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.45E-07
UDP	22487 MMBtu	Phenanthrene	2.85E-04	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.20E-03
EDG1	1878 MMBtu	Phenanthrene	2.85E-04	See Process TAC and GHG Emissions Sheet, p. 6	2.67E-04
MFD	468 MMBtu	Phenanthrene	2.72E-06	See Process TAC and GHG Emissions Sheet, p. 4	6.35E-07
EDFP	188 MMBtu	Phenanthrene	2.85E-04	See Process TAC and GHG Emissions Sheet, p. 6	2.67E-05
TD1	240000 gal	Phenanthrene	4.26E-08	See Tank Emission Calculations Sheet, p. 1	5.11E-06
TD2	15000 gal	Phenanthrene	7.17E-08	See Tank Emission Calculations Sheet, p. 1	5.38E-07
TOTAL		**Phenanthrene**			**3.50E-03**
TG1	120000 gal	Phenol	8.49E-06	See Tank Emission Calculations Sheet, p. 1	5.09E-04
TD1	240000 gal	Phenol	2.18E-08	See Tank Emission Calculations Sheet, p. 1	2.62E-06
TD2	15000 gal	Phenol	3.67E-08	See Tank Emission Calculations Sheet, p. 1	2.75E-07
TOTAL		**Phenol**			**5.12E-04**
CEM1	18742 ton	Phosphorus, white	6.94E-07	See Process TAC and GHG Emissions Sheet, p. 12	6.50E-06
CEM2	18742 ton	Phosphorus, white	6.94E-07	See Process TAC and GHG Emissions Sheet, p. 12	6.50E-06
CEM5	18742 ton	Phosphorus, white	1.60E-06	See Process TAC and GHG Emissions Sheet, p. 12	1.50E-05
TOTAL		**Phosphorus, white**			**2.80E-05**
UB	530 ton	Propylene	2.80E-02	See Mine TAC and GHG Emissions Sheet, p. 3	7.41E-03
BRWB	69 ton	Propylene	2.80E-02	See Mine TAC and GHG Emissions Sheet, p. 3	9.56E-04
HA	8760 MMBtu	Propylene	2.30E-04	See Process TAC and GHG Emissions Sheet, p. 2	1.01E-03
HPO	8760 MMBtu	Propylene	2.30E-04	See Process TAC and GHG Emissions Sheet, p. 2	1.01E-03
HL	8760 MMBtu	Propylene	2.30E-04	See Process TAC and GHG Emissions Sheet, p. 2	1.01E-03
HWW	8760 MMBtu	Propylene	2.30E-04	See Process TAC and GHG Emissions Sheet, p. 2	1.01E-03
HTW	17520 MMBtu	Propylene	2.30E-04	See Process TAC and GHG Emissions Sheet, p. 2	2.02E-03
HMO	8760 MMBtu	Propylene	2.30E-04	See Process TAC and GHG Emissions Sheet, p. 2	1.01E-03
UDP	22487 MMBtu	Propylene	3.41E-03	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.83E-02
EDG1	1878 MMBtu	Propylene	3.41E-03	See Process TAC and GHG Emissions Sheet, p. 6	3.20E-03
MFD	468 MMBtu	Propylene	7.30E-05	See Process TAC and GHG Emissions Sheet, p. 4	1.71E-05
EDFP	188 MMBtu	Propylene	3.41E-03	See Process TAC and GHG Emissions Sheet, p. 6	3.20E-04
TOTAL		**Propylene**			**5.73E-02**
HA	8760 MMBtu	Pyrene	5.49E-09	See Process TAC and GHG Emissions Sheet, p. 2	2.40E-08
HPO	8760 MMBtu	Pyrene	5.49E-09	See Process TAC and GHG Emissions Sheet, p. 2	2.40E-08
HL	8760 MMBtu	Pyrene	5.49E-09	See Process TAC and GHG Emissions Sheet, p. 2	2.40E-08
HWW	8760 MMBtu	Pyrene	5.49E-09	See Process TAC and GHG Emissions Sheet, p. 2	2.40E-08
HTW	17520 MMBtu	Pyrene	5.49E-09	See Process TAC and GHG Emissions Sheet, p. 2	4.81E-08
HMO	8760 MMBtu	Pyrene	5.49E-09	See Process TAC and GHG Emissions Sheet, p. 2	2.40E-08
UDP	22487 MMBtu	Pyrene	6.15E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.91E-04
EDG1	1878 MMBtu	Pyrene	6.15E-05	See Process TAC and GHG Emissions Sheet, p. 6	5.77E-05
MFD	468 MMBtu	Pyrene	2.98E-07	See Process TAC and GHG Emissions Sheet, p. 4	6.97E-08
EDFP	188 MMBtu	Pyrene	6.15E-05	See Process TAC and GHG Emissions Sheet, p. 6	5.77E-06
TOTAL		**Pyrene**			**7.55E-04**
UBD	1234 MMBtu	Selenium and compounds	1.50E-05	See Mine TAC and GHG Emissions Sheet, p. 3	9.25E-06
BRWBD	160 MMBtu	Selenium and compounds	1.50E-05	See Mine TAC and GHG Emissions Sheet, p. 3	1.19E-06
HA	8760 MMBtu	Selenium and compounds	2.35E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-07
HPO	8760 MMBtu	Selenium and compounds	2.35E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-07
HL	8760 MMBtu	Selenium and compounds	2.35E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-07
HWW	8760 MMBtu	Selenium and compounds	2.35E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-07
HTW	17520 MMBtu	Selenium and compounds	2.35E-08	See Process TAC and GHG Emissions Sheet, p. 2	2.06E-07
HMO	8760 MMBtu	Selenium and compounds	2.35E-08	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-07
CEM1	18742 ton	Selenium and compounds	1.00E-08	See Process TAC and GHG Emissions Sheet, p. 12	9.40E-08

CEM2	18742 ton	Selenium and compounds	1.00E-08	See Process TAC and GHG Emissions Sheet, p. 12	9.40E-08
UDP	22487 MMBtu	Selenium and compounds	1.61E-05	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.81E-04
EDG1	1878 MMBtu	Selenium and compounds	1.61E-05	See Process TAC and GHG Emissions Sheet, p. 6	1.51E-05
MFD	468 MMBtu	Selenium and compounds	1.61E-05	See Process TAC and GHG Emissions Sheet, p. 4	3.76E-06
EDFP	188 MMBtu	Selenium and compounds	1.61E-05	See Process TAC and GHG Emissions Sheet, p. 6	1.51E-06
TOTAL		**Selenium and compounds**			**2.12E-04**
OC	297840 ton	Silica, crystalline (respirable)	1.45E-03	See Process TAC and GHG Emissions Sheet, p. 9	2.16E-01
BC	247000 ton	Silica, crystalline (respirable)	1.35E-02	See Process TAC and GHG Emissions Sheet, p. 9	1.67E+00
CKD	1752 ton	Silica, crystalline (respirable)	1.91E-01	See Process TAC and GHG Emissions Sheet, p. 9	1.67E-01
MFP	468 MMBtu	Silica, crystalline (respirable)	6.95E-01	See Process TAC and GHG Emissions Sheet, p. 9	1.63E-01
UFD	291200 ton	Silica, crystalline (respirable)	3.29E-04	See Mine TAC and GHG Emissions Sheet, p. 1	4.80E-02
AFD	247000 ton	Silica, crystalline (respirable)	4.01E-03	See Mine TAC and GHG Emissions Sheet, p. 1	4.95E-01
CEM1	18742 ton	Silica, crystalline (respirable)	6.80E-06	See Process TAC and GHG Emissions Sheet, p. 12	6.37E-05
CEM2	18742 ton	Silica, crystalline (respirable)	6.80E-06	See Process TAC and GHG Emissions Sheet, p. 12	6.37E-05
CEM3	249000 ton	Silica, crystalline (respirable)	2.10E-03	See Process TAC and GHG Emissions Sheet, p. 9	2.61E-01
CEM4	249000 ton	Silica, crystalline (respirable)	1.78E-03	See Process TAC and GHG Emissions Sheet, p. 9	2.22E-01
CEM5	18742 ton	Silica, crystalline (respirable)	1.36E-05	See Process TAC and GHG Emissions Sheet, p. 12	1.27E-04
LS1	329 ton	Silica, crystalline (respirable)	3.40E-09	See Process TAC and GHG Emissions Sheet, p. 12	5.58E-10
LS2	329 ton	Silica, crystalline (respirable)	2.80E-08	See Process TAC and GHG Emissions Sheet, p. 12	4.60E-09
TOTAL		**Silica, crystalline (respirable)**			**3.24E+00**
OC	297840 ton	Silver and compounds	5.60E-08	See Process TAC and GHG Emissions Sheet, p. 9	8.35E-06
BC	247000 ton	Silver and compounds	1.06E-07	See Process TAC and GHG Emissions Sheet, p. 9	1.31E-05
CKD	1752 ton	Silver and compounds	2.80E-06	See Process TAC and GHG Emissions Sheet, p. 9	2.45E-06
MFP	468 MMBtu	Silver and compounds	1.02E-05	See Process TAC and GHG Emissions Sheet, p. 9	2.39E-06
UFD	291200 ton	Silver and compounds	8.84E-09	See Mine TAC and GHG Emissions Sheet, p. 1	1.29E-06
AFD	247000 ton	Silver and compounds	4.17E-08	See Mine TAC and GHG Emissions Sheet, p. 1	5.15E-06
CEM3	249000 ton	Silver and compounds	1.29E-08	See Process TAC and GHG Emissions Sheet, p. 9	1.61E-06
CEM4	249000 ton	Silver and compounds	8.98E-09	See Process TAC and GHG Emissions Sheet, p. 9	1.12E-06
TOTAL		**Silver and compounds**			**3.55E-05**
UB	530 ton	Styrene	1.80E-03	See Mine TAC and GHG Emissions Sheet, p. 3	4.76E-04
BRWB	69 ton	Styrene	1.80E-03	See Mine TAC and GHG Emissions Sheet, p. 3	6.14E-05
TD1	240000 gal	Styrene	1.09E-08	See Tank Emission Calculations Sheet, p. 1	1.31E-06
TD2	15000 gal	Styrene	1.83E-08	See Tank Emission Calculations Sheet, p. 1	1.38E-07
TOTAL		**Styrene**			**5.39E-04**
UB	530 ton	Toluene	3.60E-03	See Mine TAC and GHG Emissions Sheet, p. 3	9.52E-04
BRWB	69 ton	Toluene	3.60E-03	See Mine TAC and GHG Emissions Sheet, p. 3	1.23E-04
HA	8760 MMBtu	Toluene	3.59E-05	See Process TAC and GHG Emissions Sheet, p. 2	1.57E-04
HPO	8760 MMBtu	Toluene	3.59E-05	See Process TAC and GHG Emissions Sheet, p. 2	1.57E-04
HL	8760 MMBtu	Toluene	3.59E-05	See Process TAC and GHG Emissions Sheet, p. 2	1.57E-04
HWW	8760 MMBtu	Toluene	3.59E-05	See Process TAC and GHG Emissions Sheet, p. 2	1.57E-04
HTW	17520 MMBtu	Toluene	3.59E-05	See Process TAC and GHG Emissions Sheet, p. 2	3.14E-04
HMO	8760 MMBtu	Toluene	3.59E-05	See Process TAC and GHG Emissions Sheet, p. 2	1.57E-04
UDP	22487 MMBtu	Toluene	7.69E-04	See Nonroad TAC and GHG Emissions Sheet, p. 2	8.65E-03
EDG1	1878 MMBtu	Toluene	7.69E-04	See Process TAC and GHG Emissions Sheet, p. 6	7.22E-04
MFD	468 MMBtu	Toluene	3.21E-05	See Process TAC and GHG Emissions Sheet, p. 4	7.51E-06
EDFP	188 MMBtu	Toluene	7.69E-04	See Process TAC and GHG Emissions Sheet, p. 6	7.22E-05
TG1	120000 gal	Toluene	1.11E-03	See Tank Emission Calculations Sheet, p. 1	6.68E-02
TD1	240000 gal	Toluene	1.09E-08	See Tank Emission Calculations Sheet, p. 1	1.31E-06
TD2	15000 gal	Toluene	1.83E-08	See Tank Emission Calculations Sheet, p. 1	1.38E-07
TOTAL		**Toluene**			**7.84E-02**
OC	297840 ton	Vanadium (fume or dust)	9.63E-08	See Process TAC and GHG Emissions Sheet, p. 9	1.43E-05
BC	247000 ton	Vanadium (fume or dust)	1.16E-06	See Process TAC and GHG Emissions Sheet, p. 9	1.43E-04
HA	8760 MMBtu	Vanadium (fume or dust)	2.25E-06	See Process TAC and GHG Emissions Sheet, p. 2	9.88E-06
HPO	8760 MMBtu	Vanadium (fume or dust)	2.25E-06	See Process TAC and GHG Emissions Sheet, p. 2	9.88E-06
HL	8760 MMBtu	Vanadium (fume or dust)	2.25E-06	See Process TAC and GHG Emissions Sheet, p. 2	9.88E-06
HWW	8760 MMBtu	Vanadium (fume or dust)	2.25E-06	See Process TAC and GHG Emissions Sheet, p. 2	9.88E-06
HTW	17520 MMBtu	Vanadium (fume or dust)	2.25E-06	See Process TAC and GHG Emissions Sheet, p. 2	1.98E-05
HMO	8760 MMBtu	Vanadium (fume or dust)	2.25E-06	See Process TAC and GHG Emissions Sheet, p. 2	9.88E-06
CKD	1752 ton	Vanadium (fume or dust)	4.82E-06	See Process TAC and GHG Emissions Sheet, p. 9	4.22E-06
MFP	468 MMBtu	Vanadium (fume or dust)	1.75E-05	See Process TAC and GHG Emissions Sheet, p. 9	4.10E-06
UFD	291200 ton	Vanadium (fume or dust)	1.70E-08	See Mine TAC and GHG Emissions Sheet, p. 1	2.48E-06
AFD	247000 ton	Vanadium (fume or dust)	2.41E-07	See Mine TAC and GHG Emissions Sheet, p. 1	2.98E-05
CEM3	249000 ton	Vanadium (fume or dust)	1.41E-07	See Process TAC and GHG Emissions Sheet, p. 9	1.75E-05
CEM4	249000 ton	Vanadium (fume or dust)	9.79E-08	See Process TAC and GHG Emissions Sheet, p. 9	1.22E-05
TOTAL		**Vanadium (fume or dust)**			**2.97E-04**
HA	8760 MMBtu	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.67E-05	See Process TAC and GHG Emissions Sheet, p. 2	1.17E-04
HPO	8760 MMBtu	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.67E-05	See Process TAC and GHG Emissions Sheet, p. 2	1.17E-04
HL	8760 MMBtu	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.67E-05	See Process TAC and GHG Emissions Sheet, p. 2	1.17E-04
HWW	8760 MMBtu	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.67E-05	See Process TAC and GHG Emissions Sheet, p. 2	1.17E-04
HTW	17520 MMBtu	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.67E-05	See Process TAC and GHG Emissions Sheet, p. 2	2.34E-04
HMO	8760 MMBtu	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.67E-05	See Process TAC and GHG Emissions Sheet, p. 2	1.17E-04
UDP	22487 MMBtu	Xylene (mixture), including m-xylene, o-xylene, p-xylene	3.09E-03	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.48E-02
EDG1	1878 MMBtu	Xylene (mixture), including m-xylene, o-xylene, p-xylene	3.09E-03	See Process TAC and GHG Emissions Sheet, p. 6	2.91E-03
MFD	468 MMBtu	Xylene (mixture), including m-xylene, o-xylene, p-xylene	1.17E-05	See Process TAC and GHG Emissions Sheet, p. 4	2.73E-06
EDFP	188 MMBtu	Xylene (mixture), including m-xylene, o-xylene, p-xylene	3.09E-03	See Process TAC and GHG Emissions Sheet, p. 6	2.91E-04
TG1	120000 gal	Xylene (mixture), including m-xylene, o-xylene, p-xylene	1.11E-03	See Tank Emission Calculations Sheet, p. 1	6.64E-02
TD1	240000 gal	Xylene (mixture), including m-xylene, o-xylene, p-xylene	9.88E-08	See Tank Emission Calculations Sheet, p. 1	1.19E-05
TD2	15000 gal	Xylene (mixture), including m-xylene, o-xylene, p-xylene	1.66E-07	See Tank Emission Calculations Sheet, p. 1	1.25E-06
TOTAL		**Xylene (mixture), including m-xylene, o-xylene, p-xylene**			**1.05E-01**
OC	297840 ton	Zinc and compounds	9.86E-08	See Process TAC and GHG Emissions Sheet, p. 9	1.47E-05
BC	247000 ton	Zinc and compounds	1.06E-06	See Process TAC and GHG Emissions Sheet, p. 9	1.30E-04
UBD	1234 MMBtu	Zinc and compounds	4.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	2.47E-06
BRWBD	160 MMBtu	Zinc and compounds	4.00E-06	See Mine TAC and GHG Emissions Sheet, p. 3	3.18E-07
HA	8760 MMBtu	Zinc and compounds	2.84E-05	See Process TAC and GHG Emissions Sheet, p. 2	1.25E-04
HPO	8760 MMBtu	Zinc and compounds	2.84E-05	See Process TAC and GHG Emissions Sheet, p. 2	1.25E-04
HL	8760 MMBtu	Zinc and compounds	2.84E-05	See Process TAC and GHG Emissions Sheet, p. 2	1.25E-04
HWW	8760 MMBtu	Zinc and compounds	2.84E-05	See Process TAC and GHG Emissions Sheet, p. 2	1.25E-04
HTW	17520 MMBtu	Zinc and compounds	2.84E-05	See Process TAC and GHG Emissions Sheet, p. 2	2.49E-04
HMO	8760 MMBtu	Zinc and compounds	2.84E-05	See Process TAC and GHG Emissions Sheet, p. 2	1.25E-04
CKD	1752 ton	Zinc and compounds	4.93E-06	See Process TAC and GHG Emissions Sheet, p. 9	4.32E-06
MFP	468 MMBtu	Zinc and compounds	1.80E-05	See Process TAC and GHG Emissions Sheet, p. 9	4.20E-06
UFD	291200 ton	Zinc and compounds	1.72E-08	See Mine TAC and GHG Emissions Sheet, p. 1	2.50E-06
AFD	247000 ton	Zinc and compounds	2.24E-07	See Mine TAC and GHG Emissions Sheet, p. 1	2.77E-05
CEM3	249000 ton	Zinc and compounds	1.28E-07	See Process TAC and GHG Emissions Sheet, p. 9	1.60E-05
CEM4	249000 ton	Zinc and compounds	8.93E-08	See Process TAC and GHG Emissions Sheet, p. 9	1.11E-05
UDP	22487 MMBtu	Zinc and compounds	1.64E-04	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.84E-03
EDG1	1878 MMBtu	Zinc and compounds	1.64E-04	See Process TAC and GHG Emissions Sheet, p. 6	1.53E-04
MFD	468 MMBtu	Zinc and compounds	1.64E-04	See Process TAC and GHG Emissions Sheet, p. 4	3.83E-05
EDFP	188 MMBtu	Zinc and compounds	1.64E-04	See Process TAC and GHG Emissions Sheet, p. 6	1.53E-05
TOTAL		**Zinc and compounds**			**3.13E-03**

Facility name: Grassy Mountain Mine Permit Number:

Indicate which of the following categorically insignificant activities are present at the facility by placing an "X" in the "Yes" or "No" column.

Yes	No	Type of activity **Categorically Insignificant Activities**
	✔	Constituents of a chemical mixture present at less than 1 percent by weight of any chemical or compound regulated under divisions 200 through 268 excluding divisions 248 and 262 of this chapter, or less than 0.1 percent by weight of any carcinogen listed in the U.S. Department of Health and Human Service's Annual Report on Carcinogens when usage of the chemical mixture is less than 100,000 pounds/year
✔		Evaporative and tail pipe emissions from on-site motor vehicle operation
	✔	Distillate oil, kerosene, gasoline, natural gas or propane burning equipment, provided the aggregate expected actual emissions of the equipment identified as categorically insignificant do not exceed the de minimis level for any regulated pollutant, based on the expected maximum annual operation of the equipment. If a source's expected emissions from all such equipment exceed the de minimis levels, then the source may identify a subgroup of such equipment as categorically insignificant with the remainder not categorically insignificant. The following equipment may never be included as categorically insignificant: A. Any individual distillate oil, kerosene or gasoline burning equipment with a rating greater than 0.4 million Btu/hour; B. Any individual natural gas or propane burning equipment with a rating greater than 2.0 million Btu/hour
	✔	Distillate oil, kerosene, gasoline, natural gas or propane burning equipment brought on site for six months or less for maintenance, construction or similar purposes, such as but not limited to generators, pumps, hot water pressure washers and space heaters, provided that any such equipment that performs the same function as the permanent equipment, must be operated within the source's existing PSEL
	✔	Office activities
	✔	Food service activities
✔		Janitorial activities
	✔	Personal care activities
✔		Grounds keeping activities, including, but not limited to building painting and road and parking lot maintenance
	✔	On-site laundry activities
	✔	On-site recreation facilities
	✔	Instrument calibration
✔		Maintenance and repair shop
✔		Automotive repair shops or storage garages;
✔		Air cooling or ventilating equipment not designed to remove air contaminants generated by or released from associated equipment
✔		Refrigeration systems with less than 50 pounds of charge of ozone depleting substances regulated under Title VI, including pressure tanks used in refrigeration systems but excluding any combustion equipment associated with such systems
✔		Bench scale laboratory equipment and laboratory equipment used exclusively for chemical and physical analysis, including associated vacuum producing devices but excluding research and development facilities

Yes	No	Type of activity
✔		Temporary construction activities
✔		Warehouse activities
✔		Accidental fires
	✔	Air vents from air compressors
	✔	Air purification systems
	✔	Continuous emissions monitoring vent lines
	✔	Demineralized water tanks
	✔	Pre-treatment of municipal water, including use of deionized water purification systems
	✔	Electrical charging stations
	✔	Fire brigade training
	✔	Instrument air dryers and distribution
	✔	Process raw water filtration systems
	✔	Pharmaceutical packaging
	✔	Fire suppression
	✔	Blueprint making
✔		Routine maintenance, repair, and replacement such as anticipated activities most often associated with and performed during regularly scheduled equipment outages to maintain a plant and its equipment in good operating condition, including but not limited to steam cleaning, abrasive use, and woodworking
✔		Electric motors
✔		Storage tanks, reservoirs, transfer and lubricating equipment used for ASTM grade distillate or residual fuels, lubricants, and hydraulic fluids
✔		On-site storage tanks not subject to any New Source Performance Standard (NSPS), including underground storage tanks (UST), storing gasoline or diesel used exclusively for fueling of the facility's fleet of vehicles
✔		Natural gas, propane, and liquefied petroleum gas (LPG) storage tanks and transfer equipment
	✔	Pressurized tanks containing gaseous compounds
	✔	Vacuum sheet stacker vents
	✔	Emissions from wastewater discharges to publicly owned treatment works (POTW) provided the source is authorized to discharge to the POTW, not including on-site wastewater treatment and/or holding facilities
	✔	Log ponds
✔		Storm water settling basins
	✔	Fire suppression and training
	✔	Paved roads and paved parking lots within an urban growth boundary
✔		Hazardous air pollutant emissions in fugitive dust from paved and unpaved roads except for those sources that have processes or activities that contribute to the deposition and entrainment of hazardous air pollutants from surface soils
✔		Health, safety, and emergency response activities

Yes	No	Type of activity
	✔	Emergency generators and pumps used only during loss of primary equipment or utility service due to circumstances beyond the reasonable control of the owner or operator, or to address a power emergency, provided that the aggregate horsepower rating of all stationary emergency generator and pump engines is not more than 3,000 horsepower. If the aggregate horsepower rating of all stationary emergency generator and pump engines is more than 3,000 horsepower, then no emergency generators and pumps at the source may be considered categorically insignificant
	✔	Non-contact steam vents and leaks and safety and relief valves for boiler steam distribution systems
	✔	Non-contact steam condensate flash tanks
	✔	Non-contact steam vents on condensate receivers, deaerators and similar equipment
	✔	Boiler blow down tanks
	✔	Industrial cooling towers that do not use chromium-based water treatment chemicals
	✔	Ash piles maintained in a wetted condition and associated handling systems and activities
	✔	Uncontrolled oil/water separators in effluent treatment systems, excluding systems with a throughput of more than 400,000 gallons per year of effluent located at the following sources: A. Petroleum refineries; B. Sources that perform petroleum refining and re-refining of lubricating oils and greases including asphalt production by distillation and the reprocessing of oils and/or solvents for fuels; or C. Bulk gasoline plants, bulk gasoline terminals, and pipeline facilities
	✔	Combustion source flame safety purging on startup
	✔	Broke beaters, pulp and repulping tanks, stock chests and pulp handling equipment, excluding thickening equipment and repulpers
	✔	Stock cleaning and pressurized pulp washing, excluding open stock washing systems
	✔	White water storage tanks

1.3 AQ200 and AQ300 Series Forms

The following forms provide process and control device information for the project.

Facility Name: Grassy Mountain Mine Permit Number: N/A

Plant Information

Device ID: BC

1.	Portable plant? (yes/no)			YES
2.	Date installed at current location			
3.	Manufacturer and date manufactured			TBD
4.	Crusher heads: (number of each)			
	Jaws	1	Roll	0
	Cones	1	Other (specify)	N/A
5.	Plant electrical power supply (e.g., on-site generator or electric service company). If generators are used, complete form AQ213.			Electric service company

Projected Operating Schedule

6. Hours of operation:	Hours/day	Days/week	Weeks/year	**Total** hours/year
Primary schedule	12	5	52	3120
Secondary schedule				

Production Information

7.	Design Capacity (tons/hour)	79
8.	Projected maximum (tons/hour)	79
9.	Projected maximum (tons/year)	247,000

Dust Control Information

10. You will be required to control dust at the plant site, including dust from product manufacture, receipt, movement, and loading of materials, and dust from interior and access roads. Describe how you will accomplish this.

Emissions calculations are conservative because they assume no dust control, however, dust will be controlled by best management practices, including periodic wetting of borrow stockpile.

Waste Process Water

11.	A permit to discharge and/or store process wastewater may be required. Do you have, or have you applied for such a permit from DEQ? (yes/no)	YES
	If "no", have you contacted your Region's water quality section? (yes/no)	

State of Oregon Department of Environmental Quality

FORM AQ203
ROCK CRUSHER **ANSWER SHEET**

Facility Name: Grassy Mountain Mine Permit Number: N/A

Plant Information

Device ID: OC

1.	Portable plant? (yes/no)			NO
2.	Date installed at current location			
3.	Manufacturer and date manufactured			TBD
4.	Crusher heads: (number of each)			
	Jaws	1	Roll	0
	Cones	1	Other (specify)	N/A
5.	Plant electrical power supply (e.g., on-site generator or electric service company). If generators are used, complete form AQ213.			Electric service company

Projected Operating Schedule

6. Hours of operation:	Hours/day	Days/week	Weeks/year	**Total** hours/year
Primary schedule	24	7	52	8760
Secondary schedule				

Production Information

7.	Design Capacity (tons/hour)	34
8.	Projected maximum (tons/hour)	34
9.	Projected maximum (tons/year)	297,840

Dust Control Information

10. You will be required to control dust at the plant site, including dust from product manufacture, receipt, movement, and loading of materials, and dust from interior and access roads. Describe how you will accomplish this.

Wet ore from underground mine will be fed to crusher. Moisture inherent in ore will control dust.

Waste Process Water

11.	A permit to discharge and/or store process wastewater may be required. Do you have, or have you applied for such a permit from DEQ? (yes/no)	YES
	If "no", have you contacted your Region's water quality section? (yes/no)	

State of Oregon Department of Environmental Quality

ROCK CRUSHER

FORM AQ203
ANSWER SHEET

Facility Name: Grassy Mountain Mine | Permit Number: N/A

Plant Information

Device ID: WM1

1.	Portable plant? (yes/no)			NO
2.	Date installed at current location			
3.	Manufacturer and date manufactured			TBD
4.	Crusher heads: (number of each)			
	Jaws	1	Roll	0
	Cones	2	Other (specify)	Milling
5.	Plant electrical power supply (e.g., on-site generator or electric service company). If generators are used, complete form AQ213.			Electric service company

Projected Operating Schedule

6. Hours of operation:	Hours/day	Days/week	Weeks/year	**Total** hours/year
Primary schedule	24	7	52	8760
Secondary schedule				

Production Information

7.	Design Capacity (tons/hour)	34
8.	Projected maximum (tons/hour)	34
9.	Projected maximum (tons/year)	297,840

Dust Control Information

10. You will be required to control dust at the plant site, including dust from product manufacture, receipt, movement, and loading of materials, and dust from interior and access roads. Describe how you will accomplish this.

Wet ore from Ore Crushing process fed into the Wet Milling Process to further grid and separate the feed

Waste Process Water

11.	A permit to discharge and/or store process wastewater may be required. Do you have, or have you applied for such a permit from DEQ? (yes/no)	YES
	If "no", have you contacted your Region's water quality section? (yes/no)	

Facility Name: Grassy Mountain Mine Permit Number: N/A

Plant Information

Device ID: CEM

1. Portable plant? (yes/no)	No
2. Date installed at current location	TBD
3. Manufacturer and date manufactured	Simem Eagle 7000
4. Truck mixed, central mixed, or dry batch?	Central mixed
5. Plant electrical power supply (e.g., on-site generator or electric service company). If generators are used, complete form AQ213.	Electric Service Company

Projected Operating Schedule

6. Hours of operation:	Hours/day	Days/week	Weeks/year	**Total** hours/year
Primary schedule	24	7	52	8760
Secondary schedule				

Production Information

7. Design Capacity (cubic yards/hour)	236
8. Projected maximum (cubic yards/hour)	236
9. Projected maximum (cubic yards/year)	70,106

Dust Control Information

10. You will be required to control dust at the plant site, including dust from product manufacture, receipt, movement, and loading of materials, and dust from interior and access roads. Describe how you will accomplish this.

Types of controls used may include water sprays, enclosures, hoods, curtains, shrouds, movable and telescoping chutes, and the like.

Waste Process Water

11. A permit to discharge and/or store process wastewater may be required. Do you have, or have you applied for such a permit from DEQ? (yes/no)	Yes
If "no", have you contacted your Region's water quality section? (yes/no)	

Facility Name: Grassy Mountain Mine Permit Number: N/A

Tank Information:

	Tank Identification Number			
	TG1	TD1	TD2	
1. Existing or future?	Future	Future	Future	
2. Manufacturer				
3. Date construction commenced (month/year)				
4. Date installed (month/year)				
5. Rated capacity (gallons)	10,000	30,000	3,000	
6. Height (feet)	19	18	14	
7. Diameter (feet)	9.5	18	7	
8. Submerged fill pipe? (yes or no)				
9. Type of tank	Horizontal	Vertical	Horizontal	
10. Underground? (yes or no)	No	No	No	
Underground tank fill type				
11. Above ground? (yes or no)	Yes	Yes	Yes	
a. Pipe material				
b. Pipe size				
c. Piping continuously drains downward? (yes or no)	Yes	Yes	Yes	
d. Description of condensate collection tank.				
e. Isolation valves? (yes or no)	No	No	No	
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	-0.03	-0.03	-0.03	
b. months	N/A	N/A	N/A	
13. Pressure conservation vent? (yes or no)	Yes	Yes	Yes	
If yes, enter psia.	0.03	0.03	0.03	
14. Fixed roof tank? (yes or no)	No	Yes	No	
a. roof color	WHITE	WHITE	WHITE	

	Tank Identification Number			
	TG1	TD1	TD2	
b. shell color	WHITE	WHITE	WHITE	
c. vapor space height (feet)		15.76		
d. shell condition	GOOD	GOOD	GOOD	
15. Floating roof tank? (yes or no)	NO	NO	NO	
a. type of construction	N/A	N/A	N/A	
b. condition	N/A	N/A	N/A	
c. tank color	N/A	N/A	N/A	
d. deck type	N/A	N/A	N/A	
16. External floating roof tank seal type	N/A	N/A	N/A	
17. Internal floating roof tanks				
a. seal type	N/A	N/A	N/A	
b. number of columns	N/A	N/A	N/A	
c. effective column diameter (feet)	N/A	N/A	N/A	
d. total deck seam length (feet)	N/A	N/A	N/A	
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed	N/A	N/A	N/A	
(2) unbolted cover, gasketed	N/A	N/A	N/A	
(3) unbolted cover, ungasketed	N/A	N/A	N/A	
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed	N/A	N/A	N/A	
(2) unbolted cover, gasketed	N/A	N/A	N/A	
(3) unbolted cover, ungasketed	N/A	N/A	N/A	
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed	N/A	N/A	N/A	

	Tank Identification Number			
	TG1	TD1	TD2	
(2) built up column, sliding cover, ungasketed	N/A	N/A	N/A	
(3) pipe column, flexible fabric sleeve seal	N/A	N/A	N/A	
(4) pipe column, sliding cover, gasketed	N/A	N/A	N/A	
(5) pipe column, sliding cover, ungasketed	N/A	N/A	N/A	
e.iv deck fitting types – ladder well				
(1) sliding cover, gasketed	N/A	N/A	N/A	
(2) sliding cover, ungasketed	N/A	N/A	N/A	
e.v deck fitting types – sample well or pipe				
(1) slotted pipe, sliding cover, gasket	N/A	N/A	N/A	
(2) slotted pipe, sliding cover, ungasketed	N/A	N/A	N/A	
(3) sample well, slit fabric seal, 10% open area	N/A	N/A	N/A	
(4) stub drain, 1-inch diameter	N/A	N/A	N/A	
e.vi deck fitting types – roof leg or hanger well				
(1) adjustable	N/A	N/A	N/A	
(2) fix	N/A	N/A	N/A	
e.vii deck fitting types – vacuum breaker				
(1) weighted mechanical actuation, gasketed	N/A	N/A	N/A	
(2) weighted mechanical actuation, ungasketed	N/A	N/A	N/A	
18. Maximum liquid loading rate (gallons/hour)	13.7	27.4	1.71	
19. Description of submerged fill out-loading				
20. Vapor recovery system? (yes or no)	No	No	No	

Material Stored:

21. Name/type of material stored in the tank	Gasoline	Diesel	Diesel	
22. Maximum projected throughput (gallons/year)	120,000	240,000	15,000	
23. Maximum projected turnovers per year	12	8	5	

	Tank Identification Number			
	TG1	TD1	TD2	
24. Density (pounds/gallon)	0.0065	0.0000134	0.0000134	
25. Molecular weight	67	130	130	
26. Average storage temperature (°F)	52.81	52.81	52.81	
27. Vapor pressure (psia)	3.995	0.0051	0.0051	

Facility Name: Grassy Mountain Mine Permit Number: N/A

1. Boiler Information:				
Boiler identification	HA	HPO	HL	HWW
Manufacturer				
Date manufactured (month/year)				
Date construction commenced (month/year)				
Date installed (month/year)				
Rated design heat input capacity (million Btu per hour)	1.0	1.0	1.0	1.0
Rated steam production capacity (pounds per hour)				
Primary fuel type	Propane	Propane	Propane	Propane
Max. fuel quantity used per hour (include units)	11 gal	11 gal	11 gal	11 gal
Max. fuel quantity used per year (include units)	96,800 gal	96,800 gal	96,800 gal	96,800 gal
If oil is used, sulfur content (% by wt.)	N/A	N/A	N/A	N/A
Secondary fuel type	N/A	N/A	N/A	N/A
Max. fuel quantity used per hour (include units)	N/A	N/A	N/A	N/A
Max. fuel quantity used per year (include units)	N/A	N/A	N/A	N/A
If oil is used, sulfur content (% by wt.)	N/A	N/A	N/A	N/A
Stack identification	HA	HPO	HL	HWW
Stack height (feet)	7.62	7.62	7.62	7.62
Stack gas flow rate at maximum load (dscf/minute)	169	169	169	169
Control device(s) identification from AQ300	None	None	None	None
Continuous monitoring systems	None	None	None	None

2. Describe how the boilers(s) is operated. (Refer to instructions for guidance)

Propane-fired HVAC units for conditioning buildings at the facility. Units will be used primarily during summer and winter, but maximum usage assumes year-round operation.

Facility Name: Grassy Mountain Mine Permit Number: N/A

1. Boiler Information:				
Boiler identification	HTW	HMO		
Manufacturer				
Date manufactured (month/year)				
Date construction commenced (month/year)				
Date installed (month/year)				
Rated design heat input capacity (million Btu per hour)	2.0	1.0		
Rated steam production capacity (pounds per hour)	N/A	N/A		
Primary fuel type	Propane	Propane		
Max. fuel quantity used per hour (include units)	22.1 gal	11 gal		
Max. fuel quantity used per year (include units)	193,600 gal	96,800 gal		
If oil is used, sulfur content (% by wt.)	N/A	N/A		
Secondary fuel type	N/A	N/A		
Max. fuel quantity used per hour (include units)	N/A	N/A		
Max. fuel quantity used per year (include units)	N/A	N/A		
If oil is used, sulfur content (% by wt.)	N/A	N/A		
Stack identification	HTW	HMO		
Stack height (feet)	15.5	7.62		
Stack gas flow rate at maximum load (dscf/minute)	339	169		
Control device(s) identification from AQ300	None	None		
Continuous monitoring systems	None	None		

2. Describe how the boilers(s) is operated. (Refer to instructions for guidance)

Propane-fired HVAC units for conditioning buildings at the facility. Units will be used primarily during summer and winter, but maximum usage assumes year-round operation.

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State of Oregon Department of Environmental Quality
Internal Combustion Engines and Turbines

Form AQ210
Instructions

Facility Name: Grassy Mountain Mine Permit Number: N/A

Engine Information

1.	Device ID Number	EDFP
2.	Existing or future?	Future
3.	Date construction/installation commenced	TBD
4.	Date construction/installation completed	TBD
5.	Manufacturer	TBD
6.	Date manufactured	2007 or newer
7.	Maximum rating (MMbtu/hr for turbines, Hp for others)	268 HP
8.	Control device(s) (yes/no)	No
	If yes, enter the description and identification number(s)	
9.	Description and use of engine/turbine:	
Emergency Diesel Fire Pump, limited to 100 hours of non-emergency run-time.		

Operating Schedule

10.	Projected maximum hours/day	1
11.	Projected maximum hours/year	100 (for maintenance and testing)

Fuel Information

12. Fuel usage:	a. Type	b. Hourly usage	c. Annual usage
Primary	Diesel	1.9 MMBtu/hr	187.7 MMBtu/hr
Back-up			
Other			

Stack Information

13.	Exit height (ft)	15
14.	Exit diameter (ft)	0.67
15.	Design flowrate (dscf/min)	505

Monitoring Information

16. Monitoring equipment			
fuel flow (y/n)	NO	recorder? (y/n)	NO
engine load (y/n)	NO	recorder? (y/n)	NO
other (specify)	Hour meter	recorder? (y/n)	Yes

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State of Oregon Department of Environmental Quality
Internal Combustion Engines and Turbines

Form AQ210
Instructions

Facility Name: Grassy Mountain Mine Permit Number: N/A

Engine Information

1.	Device ID Number	EDG1
2.	Existing or future?	Future
3.	Date construction/installation commenced	TBD
4.	Date construction/installation completed	TBD
5.	Manufacturer	TBD
6.	Date manufactured	2007 or newer
7.	Maximum rating (MMbtu/hr for turbines, Hp for others)	2,682 HP
8.	Control device(s) (yes/no)	No
	If yes, enter the description and identification number(s)	
9.	Description and use of engine/turbine:	
Emergency Diesel Generator; limited to 100 hours of non-emergency run-time.		

Operating Schedule

10.	Projected maximum hours/day	1
11.	Projected maximum hours/year	100 (for maintenance and testing)

Fuel Information

12. Fuel usage:	a. Type	b. Hourly usage	c. Annual usage
Primary	Diesel	18.8 MMBtu/hr	1,877.4 MMBtu/hr
Back-up			
Other			

Stack Information

13.	Exit height (ft)	10
14.	Exit diameter (ft)	0.67
15.	Design flowrate (dscf/min)	1,500

Monitoring Information

16. Monitoring equipment			
fuel flow (y/n)	NO	recorder? (y/n)	NO
engine load (y/n)	NO	recorder? (y/n)	NO
other (specify)	Hour meter	recorder? (y/n)	Yes

State of Oregon Department of Environmental Quality
Internal Combustion Engines and Turbines

Form AQ210
Instructions

Facility Name: Grassy Mountain Mine Permit Number: N/A

Engine Information

1.	Device ID Number	EQP1
2.	Existing or future?	Future
3.	Date construction/installation commenced	
4.	Date construction/installation completed	
5.	Manufacturer	Resemin Troidon 88 Dual
6.	Date manufactured	2004 or newer
7.	Maximum rating (MMbtu/hr for turbines, Hp for others)	97 HP
8.	Control device(s) (yes/no)	No
	If yes, enter the description and identification number(s)	
9.	Description and use of engine/turbine:	

Dual drill and bolter. Operated on line power when drilling. Exhaust will be released to atmosphere via mine vent. Annual schedule and fuel usage is for 3 units combined and includes underground activity only.

Operating Schedule

10.	Projected maximum hours/day	24
11.	Projected maximum hours/year	2,995

Fuel Information

12. Fuel usage:	a. Type	b. Hourly usage	c. Annual usage
Primary	Diesel	2 gal	4,792 gal
Back-up			
Other			

Stack Information

13.	Exit height (ft)	N/A
14.	Exit diameter (ft)	N/A
15.	Design flowrate (dscf/min)	N/A

Monitoring Information

16. Monitoring equipment

fuel flow (y/n)	NO	recorder? (y/n)	NO
engine load (y/n)	NO	recorder? (y/n)	NO
other (specify)	NO	recorder? (y/n)	NO

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State of Oregon Department of Environmental Quality
Internal Combustion Engines and Turbines

Form AQ210
Instructions

Facility Name: Grassy Mountain Mine Permit Number: N/A

Engine Information

1.	Device ID Number	EQP2
2.	Existing or future?	Future
3.	Date construction/installation commenced	
4.	Date construction/installation completed	
5.	Manufacturer	CAT R1600
6.	Date manufactured	2006 or newer
7.	Maximum rating (MMbtu/hr for turbines, Hp for others)	279 HP
8.	Control device(s) (yes/no)	No
	If yes, enter the description and identification number(s)	
9.	Description and use of engine/turbine:	

LHD Loader, 5.2 cubic yards. Exhaust will be released to atmosphere via mine vent. Annual schedule and fuel usage is for 4 units combined and includes underground activity only.

Operating Schedule

10.	Projected maximum hours/day	24
11.	Projected maximum hours/year	15,974

Fuel Information

12. Fuel usage:	a. Type	b. Hourly usage	c. Annual usage
Primary	Diesel	4.4 gal	70,287 gal
Back-up			
Other			

Stack Information

13.	Exit height (ft)	N/A
14.	Exit diameter (ft)	N/A
15.	Design flowrate (dscf/min)	N/A

Monitoring Information

16. Monitoring equipment			
fuel flow (y/n)	NO	recorder? (y/n)	NO
engine load (y/n)	NO	recorder? (y/n)	NO
other (specify)	NO	recorder? (y/n)	NO

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State of Oregon Department of Environmental Quality
Internal Combustion Engines and Turbines

Form AQ210
Instructions

Facility Name: Grassy Mountain Mine Permit Number: N/A

Engine Information

1.	Device ID Number	EQP3
2.	Existing or future?	Future
3.	Date construction/installation commenced	
4.	Date construction/installation completed	
5.	Manufacturer	CAT AD22
6.	Date manufactured	2006 or newer
7.	Maximum rating (MMbtu/hr for turbines, Hp for others)	325 HP
8.	Control device(s) (yes/no)	No
	If yes, enter the description and identification number(s)	
9.	Description and use of engine/turbine:	

Truck with ejector bed. Exhaust will be released to atmosphere via mine vent. Annual schedule and fuel usage is for 3 units combined and includes underground activity only.

Operating Schedule

10.	Projected maximum hours/day	24
11.	Projected maximum hours/year	11,981

Fuel Information

12. Fuel usage:	a. Type	b. Hourly usage	c. Annual usage
Primary	Diesel	5.2 gal	62,300 gal
Back-up			
Other			

Stack Information

13.	Exit height (ft)	N/A
14.	Exit diameter (ft)	N/A
15.	Design flowrate (dscf/min)	N/A

Monitoring Information

16. Monitoring equipment			
fuel flow (y/n)	NO	recorder? (y/n)	NO
engine load (y/n)	NO	recorder? (y/n)	NO
other (specify)	NO	recorder? (y/n)	NO

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State of Oregon Department of Environmental Quality
Internal Combustion Engines and Turbines

Form AQ210
Instructions

Facility Name: Grassy Mountain Mine Permit Number: N/A

Engine Information

1.	Device ID Number	EQP4
2.	Existing or future?	Future
3.	Date construction/installation commenced	
4.	Date construction/installation completed	
5.	Manufacturer	CAT 440
6.	Date manufactured	2015 or newer
7.	Maximum rating (MMbtu/hr for turbines, Hp for others)	104 HP
8.	Control device(s) (yes/no)	No
	If yes, enter the description and identification number(s)	
9.	Description and use of engine/turbine:	

Emulsion loader. Exhaust will be released to atmosphere via mine vent. Annual schedule and fuel usage is for 1 unit and includes underground activity only.

Operating Schedule

10.	Projected maximum hours/day	24
11.	Projected maximum hours/year	3,994

Fuel Information

12. Fuel usage:	a. Type	b. Hourly usage	c. Annual usage
Primary	Diesel	1.7 gal	6,789
Back-up			
Other			

Stack Information

13.	Exit height (ft)	N/A
14.	Exit diameter (ft)	N/A
15.	Design flowrate (dscf/min)	N/A

Monitoring Information

16. Monitoring equipment			
fuel flow (y/n)	NO	recorder? (y/n)	NO
engine load (y/n)	NO	recorder? (y/n)	NO
other (specify)	NO	recorder? (y/n)	NO

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State of Oregon Department of Environmental Quality
Internal Combustion Engines and Turbines

Form AQ210
Instructions

Facility Name: Grassy Mountain Mine Permit Number: N/A

Engine Information

1.	Device ID Number	EQP5
2.	Existing or future?	Future
3.	Date construction/installation commenced	
4.	Date construction/installation completed	
5.	Manufacturer	JCB 540-170
6.	Date manufactured	2007 or newer
7.	Maximum rating (MMbtu/hr for turbines, Hp for others)	130 HP
8.	Control device(s) (yes/no)	No
	If yes, enter the description and identification number(s)	
9.	Description and use of engine/turbine:	

Telehandler. Exhaust will be released to atmosphere via mine vent. Annual schedule and fuel usage is for 2 units combined and includes underground activity only.

Operating Schedule

10.	Projected maximum hours/day	24
11.	Projected maximum hours/year	7,987

Fuel Information

12. Fuel usage:	a. Type	b. Hourly usage	c. Annual usage
Primary	Diesel	2.1 gal	16,773
Back-up			
Other			

Stack Information

13.	Exit height (ft)	N/A
14.	Exit diameter (ft)	N/A
15.	Design flowrate (dscf/min)	N/A

Monitoring Information

16. Monitoring equipment			
fuel flow (y/n)	NO	recorder? (y/n)	NO
engine load (y/n)	NO	recorder? (y/n)	NO
other (specify)	NO	recorder? (y/n)	NO

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State of Oregon Department of Environmental Quality
Internal Combustion Engines and Turbines

Form AQ210
Instructions

Facility Name: Grassy Mountain Mine Permit Number: N/A

Engine Information

1.	Device ID Number	EQP6
2.	Existing or future?	Future
3.	Date construction/installation commenced	
4.	Date construction/installation completed	
5.	Manufacturer	Paus PG5HA
6.	Date manufactured	2018 or newer
7.	Maximum rating (MMbtu/hr for turbines, Hp for others)	101 HP
8.	Control device(s) (yes/no)	No
	If yes, enter the description and identification number(s)	
9.	Description and use of engine/turbine:	

Motor grader. Exhaust will be released to atmosphere via mine vent. Annual schedule and fuel usage is for 1 unit and includes underground activity only.

Operating Schedule

10.	Projected maximum hours/day	24
11.	Projected maximum hours/year	3,994

Fuel Information

12. Fuel usage:	a. Type	b. Hourly usage	c. Annual usage
Primary	Diesel	1.6 gal	6,390 gal
Back-up			
Other			

Stack Information

13.	Exit height (ft)	N/A
14.	Exit diameter (ft)	N/A
15.	Design flowrate (dscf/min)	N/A

Monitoring Information

16. Monitoring equipment			
fuel flow (y/n)	NO	recorder? (y/n)	NO
engine load (y/n)	NO	recorder? (y/n)	NO
other (specify)	NO	recorder? (y/n)	NO

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State of Oregon Department of Environmental Quality
Internal Combustion Engines and Turbines

Form AQ210
Instructions

Facility Name: Grassy Mountain Mine Permit Number: N/A

Engine Information

1.	Device ID Number	EQP9
2.	Existing or future?	Future
3.	Date construction/installation commenced	
4.	Date construction/installation completed	
5.	Manufacturer	Normet Spraymec 8100 VC
6.	Date manufactured	2007 or newer
7.	Maximum rating (MMbtu/hr for turbines, Hp for others)	100 HP
8.	Control device(s) (yes/no)	No
	If yes, enter the description and identification number(s)	
9.	Description and use of engine/turbine:	

Shotcrete sprayer. Exhaust will be released to atmosphere via mine vent. Annual schedule and fuel usage is for 1 unit and includes underground activity only.

Operating Schedule

10.	Projected maximum hours/day	24
11.	Projected maximum hours/year	998

Fuel Information

12. Fuel usage:	a. Type	b. Hourly usage	c. Annual usage
Primary	Diesel	1.6 gal	1,597 gal
Back-up			
Other			

Stack Information

13.	Exit height (ft)	N/A
14.	Exit diameter (ft)	N/A
15.	Design flowrate (dscf/min)	N/A

Monitoring Information

16. Monitoring equipment			
fuel flow (y/n)	NO	recorder? (y/n)	NO
engine load (y/n)	NO	recorder? (y/n)	NO
other (specify)	NO	recorder? (y/n)	NO

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State of Oregon Department of Environmental Quality
Internal Combustion Engines and Turbines

Form AQ210
Instructions

Facility Name: Grassy Mountain Mine Permit Number: N/A

Engine Information

1.	Device ID Number	EQP10
2.	Existing or future?	Future
3.	Date construction/installation commenced	
4.	Date construction/installation completed	
5.	Manufacturer	Normet Utimec SF 300
6.	Date manufactured	2007 or newer
7.	Maximum rating (MMbtu/hr for turbines, Hp for others)	129 HP
8.	Control device(s) (yes/no)	No
	If yes, enter the description and identification number(s)	
9.	Description and use of engine/turbine:	

Shotcrete truck. Exhaust will be released to atmosphere via mine vent. Annual schedule and fuel usage is for 1 unit and includes underground activity only.

Operating Schedule

10.	Projected maximum hours/day	24
11.	Projected maximum hours/year	3,994

Fuel Information

12. Fuel usage:	a. Type	b. Hourly usage	c. Annual usage
Primary	Diesel	2.1 gal	8,387 gal
Back-up			
Other			

Stack Information

13.	Exit height (ft)	N/A
14.	Exit diameter (ft)	N/A
15.	Design flowrate (dscf/min)	N/A

Monitoring Information

16. Monitoring equipment			
fuel flow (y/n)	NO	recorder? (y/n)	NO
engine load (y/n)	NO	recorder? (y/n)	NO
other (specify)	NO	recorder? (y/n)	NO

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State of Oregon Department of Environmental Quality
Internal Combustion Engines and Turbines

Form AQ210
Instructions

Facility Name: Grassy Mountain Mine Permit Number: N/A

Engine Information

1.	Device ID Number	EQP11
2.	Existing or future?	Future
3.	Date construction/installation commenced	
4.	Date construction/installation completed	
5.	Manufacturer	Normet Multimec MF 100
6.	Date manufactured	2007 or newer
7.	Maximum rating (MMbtu/hr for turbines, Hp for others)	148 HP
8.	Control device(s) (yes/no)	No
	If yes, enter the description and identification number(s)	
9.	Description and use of engine/turbine:	

Lube truck. Exhaust will be released to atmosphere via mine vent. Annual schedule and fuel usage is for 1 unit and includes underground activity only.

Operating Schedule

10.	Projected maximum hours/day	24
11.	Projected maximum hours/year	3,994

Fuel Information

12. Fuel usage:	a. Type	b. Hourly usage	c. Annual usage
Primary	Diesel	2.3 gal	9,185 gal
Back-up			
Other			

Stack Information

13.	Exit height (ft)	N/A
14.	Exit diameter (ft)	N/A
15.	Design flowrate (dscf/min)	N/A

Monitoring Information

16. Monitoring equipment			
fuel flow (y/n)	NO	recorder? (y/n)	NO
engine load (y/n)	NO	recorder? (y/n)	NO
other (specify)	NO	recorder? (y/n)	NO

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State of Oregon Department of Environmental Quality
Internal Combustion Engines and Turbines

Form AQ210
Instructions

Facility Name: Grassy Mountain Mine Permit Number: N/A

Engine Information

1.	Device ID Number	EQP12
2.	Existing or future?	Future
3.	Date construction/installation commenced	
4.	Date construction/installation completed	
5.	Manufacturer	Normet Multimec MF 100
6.	Date manufactured	2018 or newer
7.	Maximum rating (MMbtu/hr for turbines, Hp for others)	148 HP
8.	Control device(s) (yes/no)	No
	If yes, enter the description and identification number(s)	
9.	Description and use of engine/turbine:	

Water truck. Exhaust will be released to atmosphere via mine vent. Annual schedule and fuel usage is for 1 unit and includes underground activity only.

Operating Schedule

10.	Projected maximum hours/day	24
11.	Projected maximum hours/year	3,994

Fuel Information

12. Fuel usage:	a. Type	b. Hourly usage	c. Annual usage
Primary	Diesel	2.3 gal	9,185 gal
Back-up			
Other			

Stack Information

13.	Exit height (ft)	N/A
14.	Exit diameter (ft)	N/A
15.	Design flowrate (dscf/min)	N/A

Monitoring Information

16. Monitoring equipment

fuel flow (y/n)	NO	recorder? (y/n)	NO
engine load (y/n)	NO	recorder? (y/n)	NO
other (specify)	NO	recorder? (y/n)	NO

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State of Oregon Department of Environmental Quality
Internal Combustion Engines and Turbines

Form AQ210
Instructions

Facility Name: Grassy Mountain Mine Permit Number: N/A

Engine Information

1.	Device ID Number	MF
2.	Existing or future?	Future
3.	Date construction/installation commenced	
4.	Date construction/installation completed	
5.	Manufacturer	
6.	Date manufactured	
7.	Maximum rating (MMbtu/hr for turbines, Hp for others)	0.6 MMBTU/hr
8.	Control device(s) (yes/no)	Yes
	If yes, enter the description and identification number(s)	Baghouse, Carbon Filter (BH1,CF2)
9.	Description and use of engine/turbine:	

Diesel Melting Furnace

Operating Schedule

10.	Projected maximum hours/day	7.5
11.	Projected maximum hours/year	780

Fuel Information

12. Fuel usage:	a. Type	b. Hourly usage	c. Annual usage
Primary	Diesel	0.6 MMBtu	467.9 MMBtu
Back-up			
Other			

Stack Information

13.	Exit height (ft)	20
14.	Exit diameter (ft)	1
15.	Design flowrate (dscf/min)	3,500

Monitoring Information

16. Monitoring equipment

fuel flow (y/n)	NO	recorder? (y/n)	NO
engine load (y/n)	NO	recorder? (y/n)	NO
other (specify)		recorder? (y/n)	

Facility Name: Grassy Mountain Mine Permit Number: N/A

1.	Control Device ID	BH1		
2.	Process/Device(s) Controlled	Diesel Melting Furnace (ID MF)		
3.	Year installed	TBD		
4.	Manufacturer/Model No.	TBD		
5.	Control Efficiency (%)	Vendor guarantee requirement of 0.004 grains per dscf		
6.	Type of cleaning mechanism and frequency	TBD		
7.	Design inlet gas flow rate (acfm)	4700		
8.	Number of bags	TBD		
9.	Design air-to-cloth ratio	TBD		
10.	Design pressure drop (inches of water)	TBD		
11.	Inlet gas pretreatment? (yes/no) If yes, list control device ID and complete a separate control device form	No		

Facility Name: Grassy Mountain Mine Permit Number: N/A

1.	Control Device ID	CF2
2.	Process/Device(s) Controlled	Diesel Melting Furnace (MF)
3.	Year installed	TBD
4.	Manufacturer/Model No.	TBD
5.	Control Efficiency (%)	Not specified
6.	Design inlet gas flow rate (acfm)	4700
7.	Design parameter(s)	Carbon bed inlet temperature (F) and carbon bed loading (percent mercury loading by weight). Maximum values TBD by vendor.
8.	Inlet gas pretreatment? (yes/no) If yes, list control device ID and complete a separate control device form	Yes, BH1
9.	Describe the control device	
	Sulfur impregnated (or halogenated) activated carbon adsorption bed designed for the removal of mercury.	

MISCELLANEOUS PROCESS OR DEVICE

Facility Name: Grassy Mountain Mine Permit Number: N/A

Process Information

1. ID Number	CKB
2. Descriptive name	Carbon Regeneration Kiln (Burners)
3. Existing or future?	Future
4. Date commenced	
5. Date installed/completed	

6. Description of process:

Device is an electric burner for the Carbon Regeneration Kiln Drum process.

Operating Schedule

7. Seasonal or year-round?	Year-round
8. Batch or continuous operation?	Continuous
9. Projected maximum hours/day	24
10. Projected maximum hours/year	8,760

11. Process/device capacity:	Short term capacity		Annual usage	
Raw materials	Amount	Units	Amount	Units
Electric	N/A	N/A	N/A	N/A
Products				

12. Control devices(s) (yes/no)	No

If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).

MISCELLANEOUS PROCESS OR DEVICE

Facility Name: Grassy Mountain Mine Permit Number: N/A

Process Information

1. ID Number	CKD
2. Descriptive name	Carbon Regeneration Kiln Drum
3. Existing or future?	Future
4. Date commenced	
5. Date installed/completed	

6. Description of process:

Device regenerates carbon used in carbon-in-leach (CIL) process. Stripped carbon is loaded into a drum and indirectly heated with electric burners to burn off contaminants and re-activate the carbon for re-use in the CIL process. Emissions from the carbon kiln drum are controlled by a wet scrubber (control device VS1) and carbon filter (control device CF1). It is expected that the kiln drum has the potential to emit particulates, CO, and mercury emissions.

Operating Schedule

7. Seasonal or year-round?	Year-round
8. Batch or continuous operation?	Continuous
9. Projected maximum hours/day	24
10. Projected maximum hours/year	8,760

11. Process/device capacity:	Short term capacity		Annual usage	
Raw materials	Amount	Units	Amount	Units
Stripped Carbon	0.2	ton/hr	1,752	ton
Products				
Regenerated Carbon	0.2	ton/hr	1,752	ton

12. Control devices(s) (yes/no) Yes

If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).

VS1, CF1

Facility Name: Grassy Mountain Mine Permit Number: N/A

1.	Control Device ID	VS1		
2.	Process/Device(s) Controlled	Carbon Kiln Drum (ID CKD)		
3.	Year installed	TBD		
4.	Manufacturer/Model No.	TBD		
5.	Control Efficiency (%)	Vendor guarantee requirement of 0.06 lbs PM/hr		
6.	Type of scrubber	Venturi		
7.	Is water re-circulated?	TBD		
8.	Design water flow rate (gpm)	TBD		
9.	Design water pressure (psig)	TBD		
10.	Design inlet gas flow rate (acfm)	110		
11.	Design pressure drop (inches of water)	TBD		
12.	Inlet gas pretreatment? (yes/no) If yes, list control device ID and complete a separate control device form	No		
13.	Describe any water treatment systems*	Carbon Filter		

* Attach additional pages, if necessary.

Facility Name: Grassy Mountain Mine Permit Number: N/A

1.	Control Device ID	CF1
2.	Process/Device(s) Controlled	Carbon Kiln Drum (ID CKD)
3.	Year installed	TBD
4.	Manufacturer/Model No.	TBD
5.	Control Efficiency (%)	Not specified
6.	Design inlet gas flow rate (acfm)	110
7.	Design parameter(s)	Carbon bed inlet temperature (F) and carbon bed loading (percent mercury loading by weight). Maximum values TBD by vendor.
8.	Inlet gas pretreatment? (yes/no) If yes, list control device ID and complete a separate control device form	Yes, VS1
9.	Describe the control device	
	Sulfur impregnated (or halogenated) activated carbon adsorption bed designed for the removal of mercury.	

MISCELLANEOUS PROCESS OR DEVICE

Facility Name: Grassy Mountain Mine Permit Number: N/A

Process Information

1. ID Number	EW
2. Descriptive name	Electrowinning Cells/Pregnant Solution Tank
3. Existing or future?	Future
4. Date commenced	
5. Date installed/completed	
6. Description of process:	

Solution is fed to the electrowinning (EW) cells from a Pregnant Solution Tank (PST). Current is supplied to an inert anode through the solution and metal is plated onto a cathode. Periodically, the "cells" are opened and the plated metal is cleaned from the cathodes. Emissions from the EW Cells and PST are combined with the retort exhaust downstream of the retort condenser and are controlled by a carbon filter (control device CF3). It is expected that the EW cells and PST have the potential to emit Hg and HCN.

Operating Schedule

7. Seasonal or year-round?	Year-round
8. Batch or continuous operation?	Batch
9. Projected maximum hours/day	24
10. Projected maximum hours/year	8,760

11. Process/device capacity:	Short term capacity		Annual usage	
Raw materials	Amount	Units	Amount	Units
Pregnant Eluate Solution	N/A		N/A	
Products				
Wet Au/Ag Concentrate	N/A		21	ton

12. Control devices(s) (yes/no)	Yes

If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).

CF3

Facility Name: Grassy Mountain Mine Permit Number: N/A

1.	Control Device ID	CF3
2.	Process/Device(s) Controlled	Mercury Retort (ID MR) and Electrowinning Cells / Pregnant Solution Tank (EW)
3.	Year installed	TBD
4.	Manufacturer/Model No.	TBD
5.	Control Efficiency (%)	Not specified
6.	Design inlet gas flow rate (acfm)	26600
7.	Design parameter(s)	Carbon bed inlet temperature (F) and carbon bed loading (percent mercury loading by weight). Maximum values TBD by vendor.
8.	Inlet gas pretreatment? (yes/no) If yes, list control device ID and complete a separate control device form	Yes, CD1 (MR only)
9.	Describe the control device	
	Sulfur impregnated (or halogenated) activated carbon adsorption bed designed for the removal of mercury.	

MISCELLANEOUS PROCESS OR DEVICE

Facility Name: Grassy Mountain Mine Permit Number: N/A

Process Information

1. ID Number	LAB
2. Descriptive name	Analytical Laboratory
3. Existing or future?	Future
4. Date commenced	
5. Date installed/completed	

6. Description of process:

An analytical laboratory will be maintained on site. Ore samples will first be prepared by crushing, grinding, and screening, and then a sub-sample will undergo a fire assay to measure precious metal concentrations in the sample. Exhaust from the sample preparation and fire assay sources is ducted through a fume hood with a potential to emit particulates.

Operating Schedule

7. Seasonal or year-round?	Year-round
8. Batch or continuous operation?	Batch
9. Projected maximum hours/day	24
10. Projected maximum hours/year	8,760

11. Process/device capacity:	Short term capacity		Annual usage	
Raw materials	Amount	Units	Amount	Units
Ore Sample	6	ton/day	2,190	ton
Fire Assay Sample	0.025	ton/day	9	ton
Products				
Precious Metal from Assay	N/A	N/A	N/A	N/A

12. Control devices(s) (yes/no) No

If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).

MISCELLANEOUS PROCESS OR DEVICE

Facility Name: Grassy Mountain Mine Permit Number: N/A

Process Information

1. ID Number	LS
2. Descriptive name	Lime Silo
3. Existing or future?	Future
4. Date commenced	
5. Date installed/completed	
6. Description of process:	
55-ton silo holding dry lime for input to the lime slaker. Passive silo vent filter to control product losses during silo loading.	

Operating Schedule

7. Seasonal or year-round?	Year-round
8. Batch or continuous operation?	Continuous
9. Projected maximum hours/day	24
10. Projected maximum hours/year	8,760

11. Process/device capacity:	Short term capacity		Annual usage	
Raw materials	Amount	Units	Amount	Units
Lime Loading to Silo	55	ton/day	329	ton
Lime Unloading to Slaker	0.9	ton/day	329	ton
Products				
N/A	N/A	N/A	N/A	N/A

12. Control devices(s) (yes/no)	No
If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).	

MISCELLANEOUS PROCESS OR DEVICE

Facility Name: Grassy Mountain Mine Permit Number: N/A

Process Information

1. ID Number	MR
2. Descriptive name	Mercury Retort
3. Existing or future?	Future
4. Date commenced	
5. Date installed/completed	

6. Description of process:

Au/Ag concentrate is heated in an oven to evacuate mercury as a gas from the concentrate. The mercury vapor is then cooled, condensed, and collected as a liquid in the retort condenser (control device CD1). The exhaust exiting the retort condenser is combined with Electrowinning Cells and Pregnant Solution Tank (ID EW) exhaust and ducted through a carbon bed (control device CF3) to remove any residual mercury. It is expected that the retort has the potential to emit mercury emissions.

Operating Schedule

7. Seasonal or year-round?	Year-round
8. Batch or continuous operation?	Continuous
9. Projected maximum hours/day	24
10. Projected maximum hours/year	8,760

11. Process/device capacity:	Short term capacity		Annual usage	
Raw materials	Amount	Units	Amount	Units
Au/Ag Concentrate	N/A		21	ton
Products				
Au/Ag Concentrate	N/A		21	ton

12. Control devices(s) (yes/no) Yes

If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).

CF3, CD1

Facility Name: Grassy Mountain Mine Permit Number: N/A

1.	Control Device ID	CD1
2.	Process/Device(s) Controlled	Mercury Retort (ID MR)
3.	Year installed	TBD
4.	Manufacturer/Model No.	TBD
5.	Control Efficiency (%)	Not specified
6.	Design inlet gas flow rate (acfm)	20
7.	Design parameter(s)	Outlet exhaust temperature (F). Minimum value TBD by vendor.
8.	Inlet gas pretreatment? (yes/no) If yes, list control device ID and complete a separate control device form	No
9.	Describe the control device	
	Condenser designed to cool, condense, and collect mercury from the retort exhaust.	

1.4 AQ500 Series Forms

The following section includes the Cleaner Air Oregon Permit Application Form and the Emission Inventory worksheets. The excel workbook version of AQ520 is also provided in the digital attachments link:
https://ftps.airsci.com/?ShareToken=D96DC9BF9A4E8D0C31AED462D319ABEA495AA1CA

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Facility Information	
Facility Name	Grassy Mountain Mine
Facility Address	(T21S, R44E)
City	Malhuer County
Zip Code	
Source Number (for existing sources)	
Facility Contact	Glen Van Treek
Phone Number	(775)625-3600

INSTRUCTIONS:
- **Toxic Emissions Unit and Stack/Fugitive ID**: use IDs consistent with permit identifiers if applicable.
- **Activity Units/Type:** where possible, maintain consistency with permitted/reported Units/Type.
- **Max Daily Activity:** for semi-continuous/batch processes this value should account for co-occurring activities, process and/or maintenance, that would account for the potential maximum emissions activities for this pollutant.
  - **Actual:** values should be based on the last full year reported to DEQ or estimates of normal activity (new sources).
  - **Capacity:** maximum activity value achievable with 100% operational up-time for this unit.
  - **Requested PTE:** values that a source is requesting to be permitted on that differ from "Actuals" and "Capacity".

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Emissions Unit Information			Stack/Fugitive Information		Activity Information							
							Annual - Chronic [units/year]			Max Daily - Acute [units/day]		
Toxics Emissions Unit ID	Unit Description	Control Device[s]	Emission Type (e.g. Point or Fugitive)	Stack or Fugitive ID	Units (e.g. hours operation, tons material, gallons)	Description/Type	Actual	Requested PTE	Capacity	Actual	Requested PTE	Capacity
TEU-1	Widget Maker 1 (EXAMPLE)	Widget Waste RCO	Point	ST-1	tons	Input Material X	100	140	200	0.3	0.5	0.8
OC	Ore crusher		Fugitive	OC1-13	ton	Ore		297840	297840		816	816
BC	Borrow crusher		Fugitive	BC1-10	ton	Rock from Borrow Pit		247000	247000		950	950
HA	Administration HVAC		Point	HA	MMBtu	Propane		8760	8760		24	24
HPO	Plant Office and Dry HVAC		Point	HPO	MMBtu	Propane		8760	8760		24	24
HL	Laboratory HVAC		Point	HL	MMBtu	Propane		8760	8760		24	24
HWW	Plant Workshop and Warehouse HVAC		Point	HWW	MMBtu	Propane		8760	8760		24	24
HTW	Truck Workshop and Warehouse HVAC		Point	HTW	MMBtu	Propane		17520	17520		48	48
HMO	Mine Office and Changehouse HVAC		Point	HMO	MMBtu	Propane		8760	8760		24	24
CKD	Carbon Regeneration Kiln (Drum)	VS1, CF1	Point	CKD	ton	Carbon		1752	1752		4.8	4.8
CKDHG	Carbon Regeneration Kiln (Drum) (Hg emissions only)	VS1, CF1	Point	CKD	Hours of operation			8760	8760		24	24
EW	Electrowinning Cells & Pregnant Solution Tank	CF3	Point	EW	Hours of operation			8760	8760		24	24
MR	Mercury Retort	CF3, CD1	Point	MR	Hours of operation			8760	8760		24	24
MFP	Melting Furnace Particulate	CF2, BH1	Point	MF	MMBtu	Wet Au concentrate		467.9029484	467.9029484		4.499066812	0.115068493
MFHG	Melting Furnace (Hg emissions only)	CF2, BH1	Point	MF	Hours of operation			780	780		24	24
MFD	Melting Furnace Diesel Combustion	CF2, BH1	Point	MF	MMBtu	Diesel		467.9029484	467.9029484		4.499066812	4.499066812
UFD	Underground Fugitive Dust - Material Handling, drilling, blasting		Fugitive	UG	ton	Ore and Rock		291200	291200		1400	1400
AFD	Fugitive Dust - Material Handling, wind erosion, drilling, blasting		Fugitive	LAST, WRSF, CRF, S	ton	Ore and Rock		247000	247000		950	950
TSF	Tailings Storage Facility		Fugitive	TSF	Hours of operation			8760	8760		24	24
POND	Tailings Pipeline Reclaim Pond		Fugitive	POND	Hours of operation			8760	8760		24	24
LEACH1	CN Leach Tank 1		Fugitive	LEACH1	Hours of operation			8760	8760		24	24
LEACH2	CN Leach Tank 2		Fugitive	LEACH2	Hours of operation			8760	8760		24	24
CILTANK1	CIL Tank 1		Fugitive	CILTANK1	Hours of operation			8760	8760		24	24
CILTANK2	CIL Tank 2		Fugitive	CILTANK2	Hours of operation			8760	8760		24	24
CILTANK3	CIL Tank 3		Fugitive	CILTANK3	Hours of operation			8760	8760		24	24
CILTANK4	CIL Tank 4		Fugitive	CILTANK4	Hours of operation			8760	8760		24	24
CILTANK5	CIL Tank 5		Fugitive	CILTANK5	Hours of operation			8760	8760		24	24
CILTANK6	CIL Tank 6		Fugitive	CILTANK6	Hours of operation			8760	8760		24	24
CILTANK7	CIL Tank 7		Fugitive	CILTANK7	Hours of operation			8760	8760		24	24
CEM1	Cement/Shotcrete loading to silo		Point	CEM1	ton	Cement and Supplement		18741.93548	18741.93548		80	80
CEM2	Cement/Shotcrete unloading to batch plant		Point	CEM2	ton	Cement and Supplement		18741.93548	18741.93548		80	80
CEM3	Aggregate transfer		Fugitive	CEM3	ton	Aggregate		249000	249000		1125	1125
CEM4	Weigh hopper loading		Fugitive	CEM4	ton	Aggregate		249000	249000		1125	1125
CEM5	Mixer loading (central mix)		Point	CEM5	ton	Cemented Rock Fill		18741.93548	18741.93548		84.88	84.88
UDP	Underground Nonroad Activity (incl. hauling)		Fugitive	UDP	MMBtu	Diesel		22486.04154	22486.04154		108.105969	108.105969
EDG1	Emergency Generator (Mfr. Yr. >2007; diesel)		Point	EDG1	MMBtu	Diesel		1877.4	1877.4		450.576	450.576
EDFP	Emergency Diesel Fire Pump		Point	EDFP	MMBtu	Diesel		187.74	187.74		45.0576	45.0576
LS1	Lime Silo Loading		Point	LS1	ton	Lime		328.5	328.5		55	55
LS2	Lime Silo Unloading to Lime Slaker		Point	LS2	ton	Lime		328.5	328.5		0.9	0.9
TG1	Mine Site Gasoline Tank #1		Point	TG1	gal	Gasoline		120000	120000		328.7671233	328.7671233
TD1	Mine Site Diesel Tank #1		Point	TD1	gal	Diesel		240000	240000		657.5342466	657.5342466
TD2	Mine Site Diesel Tank #2		Point	TD2	gal	Diesel		15000	15000		41.09589041	41.09589041
UB	Underground blasting, emulsion VOCs		Fugitive	UG	ton	Emulsion		529.0133333	529.0133333		2.543333333	2.543333333
BRWB	Borrow blasting, ANFO VOCs		Fugitive	BRWBLAST	ton	ANFO		68.25	68.25		0.2625	0.2625
UBD	Underground blasting, emulsion metals		Fugitive	UG	MMBtu	Diesel		1233.614071	1233.614071		5.930836879	5.930836879
BRWBD	Borrow blasting, ANFO metals		Fugitive	BRWBLAST	MMBtu	Diesel		159.1531915	159.1531915		0.61212766	0.61212766
Categorically Exempt List												
LABSP	Sample Preparation		Point	LAB	ton	Samples		2190	2190		6	6
LABFA	Fire Assay		Point	LAB	ton	Samples		9.125	9.125		0.025	0.025

INSTRUCTIONS:
- **CAS or DEQ ID**: either use the drop-down provided or simply cut and paste each pollutant CAS number or DEQ ID (see DEQ Pollutant List Worksheet) emitted by the referenced TEU.
- **Chemical Name:** if a CAS number or DEQ ID is entered in *Column B*, *Column C* should perform a lookup from the DEQ Air Toxics list; alternatively, simply cut and paste the chemical names that correspond to the CAS numbers/DEQ ID in *Column B* if applicable.
- **Control Efficiency:** enter the pollutant specific control efficiency - this should include all capture and removal process efficiencies applicable to each individual pollutant.
- **EF Values:** provide emission factors for Annual and Max Daily conditions; if Annual and Max Daily EF values are equivalent, please enter value in Annual (*Column F*).
- **Emission Factor Information Reference/Notes:** provide EF references (e.g. Source Tests, AP-42, Engineering Estimates, etc) as well as any additional notes (e.g. control efficiencies).
- **Calculated Emissions:** follow guidance in "*Form Instructions*" worksheet for specific formulas.

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Toxic Emissions Unit ID	Pollutant Information		Control Efficiency	Emission Factor Information				Calculated Emissions					
				EF Values		Units	Reference/Notes	Annual - Chronic [lb/yr]			Max Daily - Acute [lb/day]		
	CAS or DEQ ID	Chemical Name		Annual - Chronic	Max Daily - Acute			Actual	Requested PTE	Capacity	Actual	Requested PTE	Capacity
TEU-1	61-82-5	Amitrole	97.50%	2.5		lb/ton	Annual and max daily EF values are the same for this TEU and its po	6.25	8.75	12.5	0.01875	0.03125	0.05
TEU-1	7440-38-2	Arsenic and compounds	0.00%	0.1		lb/ton	The control efficiency does not apply to this pollutant	10	14	20	0.03	0.05	0.08
OC	7440-36-0	Antimony and compounds		2.49E-07	2.49E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		7.41E-02	7.41E-02		2.03E-04	2.03E-04
OC	7440-38-2	Arsenic and compounds		9.25E-07	9.25E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.76E-01	2.76E-01		7.55E-04	7.55E-04
OC	7440-41-7	Beryllium and compounds		6.54E-09	6.54E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.95E-03	1.95E-03		5.34E-06	5.34E-06
OC	7440-43-9	Cadmium and compounds		1.20E-09	1.20E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		3.57E-04	3.57E-04		9.79E-07	9.79E-07
OC	18540-29-9	Chromium VI, chromate and dichromate particulate		1.67E-07	1.67E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		4.98E-02	4.98E-02		1.36E-04	1.36E-04
OC	7440-48-4	Cobalt and compounds		8.52E-09	8.52E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.54E-03	2.54E-03		6.95E-06	6.95E-06
OC	7439-92-1	Lead and compounds		3.87E-08	3.87E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.15E-02	1.15E-02		3.16E-05	3.16E-05
OC	7439-96-5	Manganese and compounds		4.55E-07	4.55E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.36E-01	1.36E-01		3.71E-04	3.71E-04
OC	7439-97-6	Mercury and compounds		1.34E-08	1.34E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		4.00E-03	4.00E-03		1.10E-05	1.10E-05
OC	365	Nickel compounds, insoluble		2.77E-08	2.77E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		8.26E-03	8.26E-03		2.26E-05	2.26E-05
OC	7440-39-3	Barium and compounds		3.97E-06	3.97E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.18E+00	1.18E+00		3.24E-03	3.24E-03
OC	7440-50-8	Copper and compounds		1.07E-07	1.07E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		3.18E-02	3.18E-02		8.72E-05	8.72E-05
OC	7440-62-2	Vanadium (fume or dust)		9.63E-08	9.63E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.87E-02	2.87E-02		7.86E-05	7.86E-05
OC	7440-66-6	Zinc and compounds		9.86E-08	9.86E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.94E-02	2.94E-02		8.05E-05	8.05E-05
OC	1313-27-5	Molybdenum trioxide		5.27E-08	5.27E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.57E-02	1.57E-02		4.30E-05	4.30E-05
OC	7440-22-4	Silver and compounds		5.60E-08	5.60E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.67E-02	1.67E-02		4.57E-05	4.57E-05
OC	7631-86-9	Silica, crystalline (respirable)		1.45E-03	1.45E-03	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		4.32E+02	4.32E+02		1.18E+00	1.18E+00
BC	7440-36-0	Antimony and compounds		2.76E-06	2.76E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		6.81E-01	6.81E-01		2.62E-03	2.62E-03
BC	7440-38-2	Arsenic and compounds		8.10E-06	8.10E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.00E+00	2.00E+00		7.70E-03	7.70E-03
BC	7440-41-7	Beryllium and compounds		1.04E-07	1.04E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.57E-02	2.57E-02		9.87E-05	9.87E-05
BC	7440-43-9	Cadmium and compounds		1.19E-08	1.19E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.95E-03	2.95E-03		1.13E-05	1.13E-05
BC	18540-29-9	Chromium VI, chromate and dichromate particulate		1.31E-06	1.31E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		3.24E-01	3.24E-01		1.24E-03	1.24E-03
BC	7440-48-4	Cobalt and compounds		1.58E-07	1.58E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		3.90E-02	3.90E-02		1.50E-04	1.50E-04
BC	7439-92-1	Lead and compounds		4.73E-07	4.73E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.17E-01	1.17E-01		4.49E-04	4.49E-04
BC	7439-96-5	Manganese and compounds		5.55E-06	5.55E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.37E+00	1.37E+00		5.27E-03	5.27E-03
BC	7439-97-6	Mercury and compounds		1.38E-07	1.38E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		3.41E-02	3.41E-02		1.31E-04	1.31E-04
BC	365	Nickel compounds, insoluble		2.56E-07	2.56E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		6.33E-02	6.33E-02		2.43E-04	2.43E-04
BC	7440-39-3	Barium and compounds		4.18E-05	4.18E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.03E+01	1.03E+01		3.97E-02	3.97E-02
BC	7440-50-8	Copper and compounds		5.61E-07	5.61E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.39E-01	1.39E-01		5.33E-04	5.33E-04
BC	7440-62-2	Vanadium (fume or dust)		1.16E-06	1.16E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.86E-01	2.86E-01		1.10E-03	1.10E-03
BC	7440-66-6	Zinc and compounds		1.06E-06	1.06E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.61E-01	2.61E-01		1.00E-03	1.00E-03
BC	1313-27-5	Molybdenum trioxide		3.80E-07	3.80E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		9.39E-02	9.39E-02		3.61E-04	3.61E-04
BC	7440-22-4	Silver and compounds		1.06E-07	1.06E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.62E-02	2.62E-02		1.01E-04	1.01E-04
BC	7631-86-9	Silica, crystalline (respirable)		1.35E-02	1.35E-02	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		3.33E+03	3.33E+03		1.28E+01	1.28E+01
UB	115-07-1	Propylene		2.80E-02	2.80E-02	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.48E+01	1.48E+01		7.12E-02	7.12E-02
UB	106-99-0	1,3-Butadiene		1.52E-03	1.52E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		8.04E-01	8.04E-01		3.87E-03	3.87E-03
UB	75-05-8	Acetonitrile		2.00E-02	2.00E-02	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.06E+01	1.06E+01		5.09E-02	5.09E-02
UB	107-02-8	Acrolein		2.00E-03	2.00E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.06E+00	1.06E+00		5.09E-03	5.09E-03
UB	67-64-1	Acetone		1.36E-03	1.36E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		7.19E-01	7.19E-01		3.46E-03	3.46E-03
UB	67-63-0	Isopropyl alcohol		2.60E-03	2.60E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.38E+00	1.38E+00		6.61E-03	6.61E-03
UB	107-13-1	Acrylonitrile		3.80E-03	3.80E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		2.01E+00	2.01E+00		9.66E-03	9.66E-03
UB	71-43-2	Benzene		2.40E-02	2.40E-02	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.27E+01	1.27E+01		6.10E-02	6.10E-02
UB	108-88-3	Toluene		3.60E-03	3.60E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.90E+00	1.90E+00		9.16E-03	9.16E-03
UB	100-41-4	Ethyl benzene		2.40E-04	2.40E-04	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.27E-01	1.27E-01		6.10E-04	6.10E-04
UB	100-42-5	Styrene		1.80E-03	1.80E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		9.52E-01	9.52E-01		4.58E-03	4.58E-03
UB	108-67-8	1,3,5-Trimethylbenzene		5.60E-04	5.60E-04	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		2.96E-01	2.96E-01		1.42E-03	1.42E-03
UB	91-20-3	Naphthalene		3.80E-03	3.80E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		2.01E+00	2.01E+00		9.66E-03	9.66E-03
BRWB	115-07-1	Propylene		2.80E-02	2.80E-02	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.91E+00	1.91E+00		7.35E-03	7.35E-03
BRWB	106-99-0	1,3-Butadiene		1.52E-03	1.52E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.04E-01	1.04E-01		3.99E-04	3.99E-04
BRWB	75-05-8	Acetonitrile		2.00E-02	2.00E-02	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.37E+00	1.37E+00		5.25E-03	5.25E-03
BRWB	107-02-8	Acrolein		2.00E-03	2.00E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.37E-01	1.37E-01		5.25E-04	5.25E-04
BRWB	67-64-1	Acetone		1.36E-03	1.36E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		9.28E-02	9.28E-02		3.57E-04	3.57E-04
BRWB	67-63-0	Isopropyl alcohol		2.60E-03	2.60E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.77E-01	1.77E-01		6.83E-04	6.83E-04
BRWB	107-13-1	Acrylonitrile		3.80E-03	3.80E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		2.59E-01	2.59E-01		9.98E-04	9.98E-04
BRWB	71-43-2	Benzene		2.40E-02	2.40E-02	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.64E+00	1.64E+00		6.30E-03	6.30E-03
BRWB	108-88-3	Toluene		3.60E-03	3.60E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		2.46E-01	2.46E-01		9.45E-04	9.45E-04
BRWB	100-41-4	Ethyl benzene		2.40E-04	2.40E-04	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.64E-02	1.64E-02		6.30E-05	6.30E-05
BRWB	100-42-5	Styrene		1.80E-03	1.80E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.23E-01	1.23E-01		4.73E-04	4.73E-04
BRWB	108-67-8	1,3,5-Trimethylbenzene		5.60E-04	5.60E-04	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		3.82E-02	3.82E-02		1.47E-04	1.47E-04
BRWB	91-20-3	Naphthalene		3.80E-03	3.80E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		2.59E-01	2.59E-01		9.98E-04	9.98E-04
UBD	7440-38-2	Arsenic and compounds		4.00E-06	4.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		4.93E-03	4.93E-03		2.37E-05	2.37E-05
UBD	7440-41-7	Beryllium and compounds		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		3.70E-03	3.70E-03		1.78E-05	1.78E-05
UBD	7440-43-9	Cadmium and compounds		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		3.70E-03	3.70E-03		1.78E-05	1.78E-05
UBD	18540-29-9	Chromium VI, chromate and dichromate particulate		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		3.70E-03	3.70E-03		1.78E-05	1.78E-05
UBD	7440-50-8	Copper and compounds		6.00E-06	6.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		7.40E-03	7.40E-03		3.56E-05	3.56E-05
UBD	7439-92-1	Lead and compounds		9.00E-06	9.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		1.11E-02	1.11E-02		5.34E-05	5.34E-05
UBD	7439-97-6	Mercury and compounds		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		3.70E-03	3.70E-03		1.78E-05	1.78E-05
UBD	7439-96-5	Manganese and compounds		6.00E-06	6.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		7.40E-03	7.40E-03		3.56E-05	3.56E-05
UBD	365	Nickel compounds, insoluble		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		3.70E-03	3.70E-03		1.78E-05	1.78E-05
UBD	7782-49-2	Selenium and compounds		1.50E-05	1.50E-05	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		1.85E-02	1.85E-02		8.90E-05	8.90E-05
UBD	7440-66-6	Zinc and compounds		4.00E-06	4.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		4.93E-03	4.93E-03		2.37E-05	2.37E-05
BRWBD	7440-38-2	Arsenic and compounds		4.00E-06	4.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		6.37E-04	6.37E-04		2.45E-06	2.45E-06
BRWBD	7440-41-7	Beryllium and compounds		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		4.77E-04	4.77E-04		1.84E-06	1.84E-06
BRWBD	7440-43-9	Cadmium and compounds		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		4.77E-04	4.77E-04		1.84E-06	1.84E-06
BRWBD	18540-29-9	Chromium VI, chromate and dichromate particulate		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		4.77E-04	4.77E-04		1.84E-06	1.84E-06
BRWBD	7440-50-8	Copper and compounds		6.00E-06	6.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		9.55E-04	9.55E-04		3.67E-06	3.67E-06
BRWBD	7439-92-1	Lead and compounds		9.00E-06	9.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		1.43E-03	1.43E-03		5.51E-06	5.51E-06
BRWBD	7439-97-6	Mercury and compounds		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		4.77E-04	4.77E-04		1.84E-06	1.84E-06
BRWBD	7439-96-5	Manganese and compounds		6.00E-06	6.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		9.55E-04	9.55E-04		3.67E-06	3.67E-06
BRWBD	365	Nickel compounds, insoluble		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		4.77E-04	4.77E-04		1.84E-06	1.84E-06
BRWBD	7782-49-2	Selenium and compounds		1.50E-05	1.50E-05	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		2.39E-03	2.39E-03		9.18E-06	9.18E-06
BRWBD	7440-66-6	Zinc and compounds		4.00E-06	4.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		6.37E-04	6.37E-04		2.45E-06	2.45E-06
HA	91-57-6	2-Methyl naphthalene		2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.06E-04	2.06E-04		5.65E-07	5.65E-07
HA	56-49-5	3-Methylcholanthrene		1.76E-09	1.76E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.55E-05	1.55E-05		4.24E-08	4.24E-08
HA	57-97-6	7,12-Dimethylbenz[a]anthracene		1.57E-08	1.57E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.37E-04	1.37E-04		3.76E-07	3.76E-07
HA	83-32-9	Acenaphthene		1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.19E-05	1.19E-05		3.27E-08	3.27E-08
HA	208-96-8	Acenaphthylene		1.19E-08	1.19E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.04E-04	1.04E-04		2.85E-07	2.85E-07

HA	75-07-0	Acetaldehyde		1.37E-05	1.37E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.20E-01	1.20E-01		3.29E-04	3.29E-04			
HA	107-02-8	Acrolein		4.74E-06	4.74E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		4.16E-02	4.16E-02		1.14E-04	1.14E-04			
HA	7664-41-7	Ammonia		1.76E-02	1.76E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.55E+02	1.55E+02		4.24E-01	4.24E-01			
HA	120-12-7	Anthracene		1.58E-09	1.58E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.38E-05	1.38E-05		3.79E-08	3.79E-08			
HA	7440-38-2	Arsenic and compounds		1.96E-07	1.96E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.72E-03	1.72E-03		4.71E-06	4.71E-06			
HA	7440-39-3	Barium and compounds		4.31E-06	4.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.78E-02	3.78E-02		1.04E-04	1.04E-04			
HA	56-55-3	Benz[a]anthracene		1.92E-09	1.92E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.68E-05	1.68E-05		4.61E-08	4.61E-08			
HA	71-43-2	Benzene		1.10E-05	1.10E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.59E-02	9.59E-02		2.63E-04	2.63E-04			
HA	50-32-8	Benzo[a]pyrene		9.61E-10	9.61E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		8.42E-06	8.42E-06		2.31E-08	2.31E-08			
HA	205-99-2	Benzo[b]fluoranthene		1.12E-09	1.12E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.79E-06	9.79E-06		2.68E-08	2.68E-08			
HA	191-24-2	Benzo[g,h,i]perylene		1.23E-09	1.23E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.07E-05	1.07E-05		2.94E-08	2.94E-08			
HA	207-08-9	Benzo[k]fluoranthene		9.71E-10	9.71E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		8.50E-06	8.50E-06		2.33E-08	2.33E-08			
HA	7440-41-7	Beryllium and compounds		1.18E-08	1.18E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.03E-04	1.03E-04		2.82E-07	2.82E-07			
HA	7440-43-9	Cadmium and compounds		1.08E-06	1.08E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.45E-03	9.45E-03		2.59E-05	2.59E-05			
HA	18540-29-9	Chromium VI, chromate and dichromate particulate		1.37E-06	1.37E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.20E-02	1.20E-02		3.29E-05	3.29E-05			
HA	218-01-9	Chrysene		1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.19E-05	1.19E-05		3.27E-08	3.27E-08			
HA	7440-48-4	Cobalt and compounds		8.24E-08	8.24E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.21E-04	7.21E-04		1.98E-06	1.98E-06			
HA	7440-50-8	Copper and compounds		8.33E-07	8.33E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.30E-03	7.30E-03		2.00E-05	2.00E-05			
HA	53-70-3	Dibenz[a,h]anthracene		8.99E-10	8.99E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.88E-06	7.88E-06		2.16E-08	2.16E-08			
HA	100-41-4	Ethyl benzene		9.31E-06	9.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		8.16E-02	8.16E-02		2.24E-04	2.24E-04			
HA	206-44-0	Fluoranthene		1.17E-08	1.17E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.02E-04	1.02E-04		2.80E-07	2.80E-07			
HA	86-73-7	Fluorene		4.50E-09	4.50E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.94E-05	3.94E-05		1.08E-07	1.08E-07			
HA	50-00-0	Formaldehyde		7.26E-05	7.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		6.36E-01	6.36E-01		1.74E-03	1.74E-03			
HA	110-54-3	Hexane		1.76E-03	1.76E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.55E+01	1.55E+01		4.24E-02	4.24E-02			
HA	193-39-5	Indeno[1,2,3-cd]pyrene		1.15E-09	1.15E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.00E-05	1.00E-05		2.75E-08	2.75E-08			
HA	7439-96-5	Manganese and compounds		3.73E-07	3.73E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.26E-03	3.26E-03		8.94E-06	8.94E-06			
HA	7439-97-6	Mercury and compounds		2.55E-07	2.55E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.23E-03	2.23E-03		6.12E-06	6.12E-06			
HA	91-20-3	Naphthalene		1.09E-06	1.09E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.58E-03	9.58E-03		2.62E-05	2.62E-05			
HA	365	Nickel compounds, insoluble		2.06E-06	2.06E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.80E-02	1.80E-02		4.94E-05	4.94E-05			
HA	106-46-7	p-Dichlorobenzene (1,4-dichlorobenzene)		1.18E-06	1.18E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.03E-02	1.03E-02		2.82E-05	2.82E-05			
HA	85-01-8	Phenanthrene		3.30E-08	3.30E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.89E-04	2.89E-04		7.93E-07	7.93E-07			
HA	115-07-1	Propylene		2.30E-04	2.30E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.02E+00	2.02E+00		5.52E-03	5.52E-03			
HA	129-00-0	Pyrene		5.49E-09	5.49E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		4.81E-05	4.81E-05		1.32E-07	1.32E-07			
HA	7782-49-2	Selenium and compounds		2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.06E-04	2.06E-04		5.65E-07	5.65E-07			
HA	108-88-3	Toluene		3.59E-05	3.59E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.14E-01	3.14E-01		8.61E-04	8.61E-04			
HA	7440-62-2	Vanadium (fume or dust)		2.25E-06	2.25E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.98E-02	1.98E-02		5.41E-05	5.41E-05			
HA	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		2.67E-05	2.67E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.34E-01	2.34E-01		6.40E-04	6.40E-04			
HA	7440-66-6	Zinc and compounds		2.84E-05	2.84E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.49E-01	2.49E-01		6.82E-04	6.82E-04			
HPO	91-57-6	2-Methyl naphthalene		2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.06E-04	2.06E-04		5.65E-07	5.65E-07			
HPO	56-49-5	3-Methylcholanthrene		1.76E-09	1.76E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.55E-05	1.55E-05		4.24E-08	4.24E-08			
HPO	57-97-6	7,12-Dimethylbenz[a]anthracene		1.57E-08	1.57E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.37E-04	1.37E-04		3.76E-07	3.76E-07			
HPO	83-32-9	Acenaphthene		1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.19E-05	1.19E-05		3.27E-08	3.27E-08			
HPO	208-96-8	Acenaphthylene		1.19E-08	1.19E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.04E-04	1.04E-04		2.85E-07	2.85E-07			
HPO	75-07-0	Acetaldehyde		1.37E-05	1.37E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.20E-01	1.20E-01		3.29E-04	3.29E-04			
HPO	107-02-8	Acrolein		4.74E-06	4.74E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		4.16E-02	4.16E-02		1.14E-04	1.14E-04			
HPO	7664-41-7	Ammonia		1.76E-02	1.76E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.55E+02	1.55E+02		4.24E-01	4.24E-01			
HPO	120-12-7	Anthracene		1.58E-09	1.58E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.38E-05	1.38E-05		3.79E-08	3.79E-08			
HPO	7440-38-2	Arsenic and compounds		1.96E-07	1.96E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.72E-03	1.72E-03		4.71E-06	4.71E-06			
HPO	7440-39-3	Barium and compounds		4.31E-06	4.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.78E-02	3.78E-02		1.04E-04	1.04E-04			
HPO	56-55-3	Benz[a]anthracene		1.92E-09	1.92E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.68E-05	1.68E-05		4.61E-08	4.61E-08			
HPO	71-43-2	Benzene		1.10E-05	1.10E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.59E-02	9.59E-02		2.63E-04	2.63E-04			
HPO	50-32-8	Benzo[a]pyrene		9.61E-10	9.61E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		8.42E-06	8.42E-06		2.31E-08	2.31E-08			
HPO	205-99-2	Benzo[b]fluoranthene		1.12E-09	1.12E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.79E-06	9.79E-06		2.68E-08	2.68E-08			
HPO	191-24-2	Benzo[g,h,i]perylene		1.23E-09	1.23E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.07E-05	1.07E-05		2.94E-08	2.94E-08			
HPO	207-08-9	Benzo[k]fluoranthene		9.71E-10	9.71E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		8.50E-06	8.50E-06		2.33E-08	2.33E-08			
HPO	7440-41-7	Beryllium and compounds		1.18E-08	1.18E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.03E-04	1.03E-04		2.82E-07	2.82E-07			
HPO	7440-43-9	Cadmium and compounds		1.08E-06	1.08E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.45E-03	9.45E-03		2.59E-05	2.59E-05			
HPO	18540-29-9	Chromium VI, chromate and dichromate particulate		1.37E-06	1.37E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.20E-02	1.20E-02		3.29E-05	3.29E-05			
HPO	218-01-9	Chrysene		1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.19E-05	1.19E-05		3.27E-08	3.27E-08			
HPO	7440-48-4	Cobalt and compounds		8.24E-08	8.24E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.21E-04	7.21E-04		1.98E-06	1.98E-06			
HPO	7440-50-8	Copper and compounds		8.33E-07	8.33E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.30E-03	7.30E-03		2.00E-05	2.00E-05			
HPO	53-70-3	Dibenz[a,h]anthracene		8.99E-10	8.99E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.88E-06	7.88E-06		2.16E-08	2.16E-08			
HPO	100-41-4	Ethyl benzene		9.31E-06	9.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		8.16E-02	8.16E-02		2.24E-04	2.24E-04			
HPO	206-44-0	Fluoranthene		1.17E-08	1.17E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.02E-04	1.02E-04		2.80E-07	2.80E-07			
HPO	86-73-7	Fluorene		4.50E-09	4.50E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.94E-05	3.94E-05		1.08E-07	1.08E-07			
HPO	50-00-0	Formaldehyde		7.26E-05	7.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		6.36E-01	6.36E-01		1.74E-03	1.74E-03			
HPO	110-54-3	Hexane		1.76E-03	1.76E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.55E+01	1.55E+01		4.24E-02	4.24E-02			
HPO	193-39-5	Indeno[1,2,3-cd]pyrene		1.15E-09	1.15E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.00E-05	1.00E-05		2.75E-08	2.75E-08			
HPO	7439-96-5	Manganese and compounds		3.73E-07	3.73E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.26E-03	3.26E-03		8.94E-06	8.94E-06			
HPO	7439-97-6	Mercury and compounds		2.55E-07	2.55E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.23E-03	2.23E-03		6.12E-06	6.12E-06			
HPO	91-20-3	Naphthalene		1.09E-06	1.09E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.58E-03	9.58E-03		2.62E-05	2.62E-05			
HPO	365	Nickel compounds, insoluble		2.06E-06	2.06E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.80E-02	1.80E-02		4.94E-05	4.94E-05			
HPO	106-46-7	p-Dichlorobenzene (1,4-dichlorobenzene)		1.18E-06	1.18E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.03E-02	1.03E-02		2.82E-05	2.82E-05			
HPO	85-01-8	Phenanthrene		3.30E-08	3.30E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.89E-04	2.89E-04		7.93E-07	7.93E-07			
HPO	115-07-1	Propylene		2.30E-04	2.30E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.02E+00	2.02E+00		5.52E-03	5.52E-03			
HPO	129-00-0	Pyrene		5.49E-09	5.49E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		4.81E-05	4.81E-05		1.32E-07	1.32E-07			
HPO	7782-49-2	Selenium and compounds		2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.06E-04	2.06E-04		5.65E-07	5.65E-07			
HPO	108-88-3	Toluene		3.59E-05	3.59E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.14E-01	3.14E-01		8.61E-04	8.61E-04			
HPO	7440-62-2	Vanadium (fume or dust)		2.25E-06	2.25E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.98E-02	1.98E-02		5.41E-05	5.41E-05			
HPO	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		2.67E-05	2.67E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.34E-01	2.34E-01		6.40E-04	6.40E-04			
HPO	7440-66-6	Zinc and compounds		2.84E-05	2.84E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.49E-01	2.49E-01		6.82E-04	6.82E-04			
HL	91-57-6	2-Methyl naphthalene		2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.06E-04	2.06E-04		5.65E-07	5.65E-07			
HL	56-49-5	3-Methylcholanthrene		1.76E-09	1.76E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.55E-05	1.55E-05		4.24E-08	4.24E-08			
HL	57-97-6	7,12-Dimethylbenz[a]anthracene		1.57E-08	1.57E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.37E-04	1.37E-04		3.76E-07	3.76E-07			
HL	83-32-9	Acenaphthene		1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.19E-05	1.19E-05		3.27E-08	3.27E-08			
HL	208-96-8	Acenaphthylene		1.19E-08	1.19E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.04E-04	1.04E-04		2.85E-07	2.85E-07			
HL	75-07-0	Acetaldehyde		1.37E-05	1.37E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.20E-01	1.20E-01		3.29E-04	3.29E-04			
HL	107-02-8	Acrolein		4.74E-06	4.74E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		4.16E-02	4.16E-02		1.14E-04	1.14E-04			
HL	7664-41-7	Ammonia		1.76E-02	1.76E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.55E+02	1.55E+02		4.24E-01	4.24E-01			
HL	120-12-7	Anthracene		1.58E-09	1.58E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.38E-05	1.38E-05		3.79E-08	3.79E-08			
HL	7440-38-2	Arsenic and compounds		1.96E-07	1.96E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.72E-03	1.72E-03		4.71E-06	4.71E-06			
HL	7440-39-3	Barium and compounds		4.31E-06	4.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.78E-02	3.78E-02		1.04E-04	1.04E-04			
HL	56-55-3	Benz[a]anthracene		1.92E-09	1.92E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.68E-05	1.68E-05		4.61E-08	4.61E-08			
HL	71-43-2	Benzene		1.10E-05	1.10E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.59E-02	9.59E-02		2.63E-04	2.63E-04			
HL	50-32-8	Benzo[a]pyrene		9.61E-10	9.61E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		8.42E-06	8.42E-06		2.31E-08	2.31E-08			
HL	205-99-2	Benzo[b]fluoranthene		1.12E-09	1.12E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.79E-06	9.79E-06		2.68E-08	2.68E-08			
HL	191-24-2	Benzo[g,h,i]perylene		1.23E-09	1.23E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.07E-05	1.07E-05		2.94E-08	2.94E-08			
HL	207-08-9	Benzo[k]fluoranthene		9.71E-10	9.71E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		8.50E-06	8.50E-06		2.33E-08	2.33E-08			
HL	7440-41-7	Beryllium and compounds		1.18E-08	1.18E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.03E-04	1.03E-04		2.82E-07	2.82E-07			
HL	7440-43-9	Cadmium and compounds		1.08E-06	1.08E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.45E-03	9.45E-03		2.59E-05	2.59E-05			
HL	18540-29-9	Chromium VI, chromate and dichromate particulate		1.37E-06	1.37E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.20E-02	1.20E-02		3.29E-05	3.29E-05			
HL	218-01-9	Chrysene		1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.19E-05	1.19E-05		3.27E-08	3.27E-08			
HL	7440-48-4	Cobalt and compounds		8.24E-08	8.24E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.21E-04	7.21E-04		1.98E-06	1.98E-06			
HL	7440-50-8	Copper and compounds		8.33E-07	8.33E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.30E-03	7.30E-03		2.00E-05	2.00E-05			
HL	53-70-3	Dibenz[a,h]anthracene		8.99E-10	8.99E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.88E-06	7.88E-06		2.16E-08	2.16E-08			

HL	100-41-4	Ethyl benzene	9.31E-06	9.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	8.16E-02	8.16E-02	2.24E-04	2.24E-04
HL	206-44-0	Fluoranthene	1.17E-08	1.17E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.02E-04	1.02E-04	2.80E-07	2.80E-07
HL	86-73-7	Fluorene	4.50E-09	4.50E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.94E-05	3.94E-05	1.08E-07	1.08E-07
HL	50-00-0	Formaldehyde	7.26E-05	7.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	6.36E-01	6.36E-01	1.74E-03	1.74E-03
HL	110-54-3	Hexane	1.76E-03	1.76E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.55E+01	1.55E+01	4.24E-02	4.24E-02
HL	193-39-5	Indeno[1,2,3-cd]pyrene	1.15E-09	1.15E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.00E-05	1.00E-05	2.75E-08	2.75E-08
HL	7439-96-5	Manganese and compounds	3.73E-07	3.73E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.26E-03	3.26E-03	8.94E-06	8.94E-06
HL	7439-97-6	Mercury and compounds	2.55E-07	2.55E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.23E-03	2.23E-03	6.12E-06	6.12E-06
HL	91-20-3	Naphthalene	1.09E-06	1.09E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.58E-03	9.58E-03	2.62E-05	2.62E-05
HL	365	Nickel compounds, insoluble	2.06E-06	2.06E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.80E-02	1.80E-02	4.94E-05	4.94E-05
HL	106-46-7	p-Dichlorobenzene (1,4-dichlorobenzene)	1.18E-06	1.18E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-02	1.03E-02	2.82E-05	2.82E-05
HL	85-01-8	Phenanthrene	3.30E-08	3.30E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.89E-04	2.89E-04	7.93E-07	7.93E-07
HL	115-07-1	Propylene	2.30E-04	2.30E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.02E+00	2.02E+00	5.52E-03	5.52E-03
HL	129-00-0	Pyrene	5.49E-09	5.49E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.81E-05	4.81E-05	1.32E-07	1.32E-07
HL	7782-49-2	Selenium and compounds	2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.06E-04	2.06E-04	5.65E-07	5.65E-07
HL	108-88-3	Toluene	3.59E-05	3.59E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.14E-01	3.14E-01	8.61E-04	8.61E-04
HL	7440-62-2	Vanadium (fume or dust)	2.25E-06	2.25E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.98E-02	1.98E-02	5.41E-05	5.41E-05
HL	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.67E-05	2.67E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.34E-01	2.34E-01	6.40E-04	6.40E-04
HL	7440-66-6	Zinc and compounds	2.84E-05	2.84E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.49E-01	2.49E-01	6.82E-04	6.82E-04
HWW	91-57-6	2-Methyl naphthalene	2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.06E-04	2.06E-04	5.65E-07	5.65E-07
HWW	56-49-5	3-Methylcholanthrene	1.76E-09	1.76E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.55E-05	1.55E-05	4.24E-08	4.24E-08
HWW	57-97-6	7,12-Dimethylbenz[a]anthracene	1.57E-08	1.57E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.37E-04	1.37E-04	3.76E-07	3.76E-07
HWW	83-32-9	Acenaphthene	1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.19E-05	1.19E-05	3.27E-08	3.27E-08
HWW	208-96-8	Acenaphthylene	1.19E-08	1.19E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.04E-04	1.04E-04	2.85E-07	2.85E-07
HWW	75-07-0	Acetaldehyde	1.37E-05	1.37E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.20E-01	1.20E-01	3.29E-04	3.29E-04
HWW	107-02-8	Acrolein	4.74E-06	4.74E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.16E-02	4.16E-02	1.14E-04	1.14E-04
HWW	7664-41-7	Ammonia	1.76E-02	1.76E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.55E+02	1.55E+02	4.24E-01	4.24E-01
HWW	120-12-7	Anthracene	1.58E-09	1.58E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.38E-05	1.38E-05	3.79E-08	3.79E-08
HWW	7440-38-2	Arsenic and compounds	1.96E-07	1.96E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.72E-03	1.72E-03	4.71E-06	4.71E-06
HWW	7440-39-3	Barium and compounds	4.31E-06	4.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.78E-02	3.78E-02	1.04E-04	1.04E-04
HWW	56-55-3	Benz[a]anthracene	1.92E-09	1.92E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.68E-05	1.68E-05	4.61E-08	4.61E-08
HWW	71-43-2	Benzene	1.10E-05	1.10E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.59E-02	9.59E-02	2.63E-04	2.63E-04
HWW	50-32-8	Benzo[a]pyrene	9.61E-10	9.61E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	8.42E-06	8.42E-06	2.31E-08	2.31E-08
HWW	205-99-2	Benzo[b]fluoranthene	1.12E-09	1.12E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.79E-06	9.79E-06	2.68E-08	2.68E-08
HWW	191-24-2	Benzo[g,h,i]perylene	1.23E-09	1.23E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.07E-05	1.07E-05	2.94E-08	2.94E-08
HWW	207-08-9	Benzo[k]fluoranthene	9.71E-10	9.71E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	8.50E-06	8.50E-06	2.33E-08	2.33E-08
HWW	7440-41-7	Beryllium and compounds	1.18E-08	1.18E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-04	1.03E-04	2.82E-07	2.82E-07
HWW	7440-43-9	Cadmium and compounds	1.08E-06	1.08E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.45E-03	9.45E-03	2.59E-05	2.59E-05
HWW	18540-29-9	Chromium VI, chromate and dichromate particulate	1.37E-06	1.37E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.20E-02	1.20E-02	3.29E-05	3.29E-05
HWW	218-01-9	Chrysene	1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.19E-05	1.19E-05	3.27E-08	3.27E-08
HWW	7440-48-4	Cobalt and compounds	8.24E-08	8.24E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	7.21E-04	7.21E-04	1.98E-06	1.98E-06
HWW	7440-50-8	Copper and compounds	8.33E-07	8.33E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	7.30E-03	7.30E-03	2.00E-05	2.00E-05
HWW	53-70-3	Dibenz[a,h]anthracene	8.99E-10	8.99E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	7.88E-06	7.88E-06	2.16E-08	2.16E-08
HWW	100-41-4	Ethyl benzene	9.31E-06	9.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	8.16E-02	8.16E-02	2.24E-04	2.24E-04
HWW	206-44-0	Fluoranthene	1.17E-08	1.17E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.02E-04	1.02E-04	2.80E-07	2.80E-07
HWW	86-73-7	Fluorene	4.50E-09	4.50E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.94E-05	3.94E-05	1.08E-07	1.08E-07
HWW	50-00-0	Formaldehyde	7.26E-05	7.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	6.36E-01	6.36E-01	1.74E-03	1.74E-03
HWW	110-54-3	Hexane	1.76E-03	1.76E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.55E+01	1.55E+01	4.24E-02	4.24E-02
HWW	193-39-5	Indeno[1,2,3-cd]pyrene	1.15E-09	1.15E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.00E-05	1.00E-05	2.75E-08	2.75E-08
HWW	7439-96-5	Manganese and compounds	3.73E-07	3.73E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.26E-03	3.26E-03	8.94E-06	8.94E-06
HWW	7439-97-6	Mercury and compounds	2.55E-07	2.55E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.23E-03	2.23E-03	6.12E-06	6.12E-06
HWW	91-20-3	Naphthalene	1.09E-06	1.09E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.58E-03	9.58E-03	2.62E-05	2.62E-05
HWW	365	Nickel compounds, insoluble	2.06E-06	2.06E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.80E-02	1.80E-02	4.94E-05	4.94E-05
HWW	106-46-7	p-Dichlorobenzene (1,4-dichlorobenzene)	1.18E-06	1.18E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-02	1.03E-02	2.82E-05	2.82E-05
HWW	85-01-8	Phenanthrene	3.30E-08	3.30E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.89E-04	2.89E-04	7.93E-07	7.93E-07
HWW	115-07-1	Propylene	2.30E-04	2.30E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.02E+00	2.02E+00	5.52E-03	5.52E-03
HWW	129-00-0	Pyrene	5.49E-09	5.49E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.81E-05	4.81E-05	1.32E-07	1.32E-07
HWW	7782-49-2	Selenium and compounds	2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.06E-04	2.06E-04	5.65E-07	5.65E-07
HWW	108-88-3	Toluene	3.59E-05	3.59E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.14E-01	3.14E-01	8.61E-04	8.61E-04
HWW	7440-62-2	Vanadium (fume or dust)	2.25E-06	2.25E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.98E-02	1.98E-02	5.41E-05	5.41E-05
HWW	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.67E-05	2.67E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.34E-01	2.34E-01	6.40E-04	6.40E-04
HWW	7440-66-6	Zinc and compounds	2.84E-05	2.84E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.49E-01	2.49E-01	6.82E-04	6.82E-04
HTW	91-57-6	2-Methyl naphthalene	2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.12E-04	4.12E-04	1.13E-06	1.13E-06
HTW	56-49-5	3-Methylcholanthrene	1.76E-09	1.76E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.09E-05	3.09E-05	8.47E-08	8.47E-08
HTW	57-97-6	7,12-Dimethylbenz[a]anthracene	1.57E-08	1.57E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.75E-04	2.75E-04	7.53E-07	7.53E-07
HTW	83-32-9	Acenaphthene	1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.39E-05	2.39E-05	6.54E-08	6.54E-08
HTW	208-96-8	Acenaphthylene	1.19E-08	1.19E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.08E-04	2.08E-04	5.69E-07	5.69E-07
HTW	75-07-0	Acetaldehyde	1.37E-05	1.37E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.40E-01	2.40E-01	6.58E-04	6.58E-04
HTW	107-02-8	Acrolein	4.74E-06	4.74E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	8.31E-02	8.31E-02	2.28E-04	2.28E-04
HTW	7664-41-7	Ammonia	1.76E-02	1.76E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.09E+02	3.09E+02	8.47E-01	8.47E-01
HTW	120-12-7	Anthracene	1.58E-09	1.58E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.77E-05	2.77E-05	7.58E-08	7.58E-08
HTW	7440-38-2	Arsenic and compounds	1.96E-07	1.96E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.44E-03	3.44E-03	9.41E-06	9.41E-06
HTW	7440-39-3	Barium and compounds	4.31E-06	4.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	7.56E-02	7.56E-02	2.07E-04	2.07E-04
HTW	56-55-3	Benz[a]anthracene	1.92E-09	1.92E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.37E-05	3.37E-05	9.22E-08	9.22E-08
HTW	71-43-2	Benzene	1.10E-05	1.10E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.92E-01	1.92E-01	5.26E-04	5.26E-04
HTW	50-32-8	Benzo[a]pyrene	9.61E-10	9.61E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.68E-05	1.68E-05	4.61E-08	4.61E-08
HTW	205-99-2	Benzo[b]fluoranthene	1.12E-09	1.12E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.96E-05	1.96E-05	5.36E-08	5.36E-08
HTW	191-24-2	Benzo[g,h,i]perylene	1.23E-09	1.23E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.15E-05	2.15E-05	5.88E-08	5.88E-08
HTW	207-08-9	Benzo[k]fluoranthene	9.71E-10	9.71E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.70E-05	1.70E-05	4.66E-08	4.66E-08
HTW	7440-41-7	Beryllium and compounds	1.18E-08	1.18E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.06E-04	2.06E-04	5.65E-07	5.65E-07
HTW	7440-43-9	Cadmium and compounds	1.08E-06	1.08E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.89E-02	1.89E-02	5.18E-05	5.18E-05
HTW	18540-29-9	Chromium VI, chromate and dichromate particulate	1.37E-06	1.37E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.40E-02	2.40E-02	6.59E-05	6.59E-05
HTW	218-01-9	Chrysene	1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.39E-05	2.39E-05	6.54E-08	6.54E-08
HTW	7440-48-4	Cobalt and compounds	8.24E-08	8.24E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.44E-03	1.44E-03	3.95E-06	3.95E-06
HTW	7440-50-8	Copper and compounds	8.33E-07	8.33E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.46E-02	1.46E-02	4.00E-05	4.00E-05
HTW	53-70-3	Dibenz[a,h]anthracene	8.99E-10	8.99E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.58E-05	1.58E-05	4.32E-08	4.32E-08
HTW	100-41-4	Ethyl benzene	9.31E-06	9.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.63E-01	1.63E-01	4.47E-04	4.47E-04
HTW	206-44-0	Fluoranthene	1.17E-08	1.17E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.04E-04	2.04E-04	5.60E-07	5.60E-07
HTW	86-73-7	Fluorene	4.50E-09	4.50E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	7.88E-05	7.88E-05	2.16E-07	2.16E-07
HTW	50-00-0	Formaldehyde	7.26E-05	7.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.27E+00	1.27E+00	3.48E-03	3.48E-03
HTW	110-54-3	Hexane	1.76E-03	1.76E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.09E+01	3.09E+01	8.47E-02	8.47E-02
HTW	193-39-5	Indeno[1,2,3-cd]pyrene	1.15E-09	1.15E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.01E-05	2.01E-05	5.51E-08	5.51E-08
HTW	7439-96-5	Manganese and compounds	3.73E-07	3.73E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	6.53E-03	6.53E-03	1.79E-05	1.79E-05
HTW	7439-97-6	Mercury and compounds	2.55E-07	2.55E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.47E-03	4.47E-03	1.22E-05	1.22E-05
HTW	91-20-3	Naphthalene	1.09E-06	1.09E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.92E-02	1.92E-02	5.25E-05	5.25E-05
HTW	365	Nickel compounds, insoluble	2.06E-06	2.06E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.61E-02	3.61E-02	9.88E-05	9.88E-05
HTW	106-46-7	p-Dichlorobenzene (1,4-dichlorobenzene)	1.18E-06	1.18E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.06E-02	2.06E-02	5.65E-05	5.65E-05
HTW	85-01-8	Phenanthrene	3.30E-08	3.30E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	5.79E-04	5.79E-04	1.59E-06	1.59E-06
HTW	115-07-1	Propylene	2.30E-04	2.30E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.03E+00	4.03E+00	1.10E-02	1.10E-02
HTW	129-00-0	Pyrene	5.49E-09	5.49E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.62E-05	9.62E-05	2.64E-07	2.64E-07
HTW	7782-49-2	Selenium and compounds	2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.12E-04	4.12E-04	1.13E-06	1.13E-06
HTW	108-88-3	Toluene	3.59E-05	3.59E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	6.29E-01	6.29E-01	1.72E-03	1.72E-03
HTW	7440-62-2	Vanadium (fume or dust)	2.25E-06	2.25E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.95E-02	3.95E-02	1.08E-04	1.08E-04
HTW	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.67E-05	2.67E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.67E-01	4.67E-01	1.28E-03	1.28E-03
HTW	7440-66-6	Zinc and compounds	2.84E-05	2.84E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.98E-01	4.98E-01	1.36E-03	1.36E-03

HMO	91-57-6	2-Methyl naphthalene	2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.06E-04	2.06E-04	5.65E-07	5.65E-07
HMO	56-49-5	3-Methylcholanthrene	1.76E-09	1.76E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.55E-05	1.55E-05	4.24E-08	4.24E-08
HMO	57-97-6	7,12-Dimethylbenz[a]anthracene	1.57E-08	1.57E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.37E-04	1.37E-04	3.76E-07	3.76E-07
HMO	83-32-9	Acenaphthene	1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.19E-05	1.19E-05	3.27E-08	3.27E-08
HMO	208-96-8	Acenaphthylene	1.19E-08	1.19E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.04E-04	1.04E-04	2.85E-07	2.85E-07
HMO	75-07-0	Acetaldehyde	1.37E-05	1.37E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.20E-01	1.20E-01	3.29E-04	3.29E-04
HMO	107-02-8	Acrolein	4.74E-06	4.74E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.16E-02	4.16E-02	1.14E-04	1.14E-04
HMO	7664-41-7	Ammonia	1.76E-02	1.76E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.55E+02	1.55E+02	4.24E-01	4.24E-01
HMO	120-12-7	Anthracene	1.58E-09	1.58E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.38E-05	1.38E-05	3.79E-08	3.79E-08
HMO	7440-38-2	Arsenic and compounds	1.96E-07	1.96E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.72E-03	1.72E-03	4.71E-06	4.71E-06
HMO	7440-39-3	Barium and compounds	4.31E-06	4.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.78E-02	3.78E-02	1.04E-04	1.04E-04
HMO	56-55-3	Benz[a]anthracene	1.92E-09	1.92E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.68E-05	1.68E-05	4.61E-08	4.61E-08
HMO	71-43-2	Benzene	1.10E-05	1.10E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.59E-02	9.59E-02	2.63E-04	2.63E-04
HMO	50-32-8	Benzo[a]pyrene	9.61E-10	9.61E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	8.42E-06	8.42E-06	2.31E-08	2.31E-08
HMO	205-99-2	Benzo[b]fluoranthene	1.12E-09	1.12E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.79E-06	9.79E-06	2.68E-08	2.68E-08
HMO	191-24-2	Benzo[g,h,i]perylene	1.23E-09	1.23E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.07E-05	1.07E-05	2.94E-08	2.94E-08
HMO	207-08-9	Benzo[k]fluoranthene	9.71E-10	9.71E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	8.50E-06	8.50E-06	2.33E-08	2.33E-08
HMO	7440-41-7	Beryllium and compounds	1.18E-08	1.18E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-04	1.03E-04	2.82E-07	2.82E-07
HMO	7440-43-9	Cadmium and compounds	1.08E-06	1.08E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.45E-03	9.45E-03	2.59E-05	2.59E-05
HMO	18540-29-9	Chromium VI, chromate and dichromate particulate	1.37E-06	1.37E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.20E-02	1.20E-02	3.29E-05	3.29E-05
HMO	218-01-9	Chrysene	1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.19E-05	1.19E-05	3.27E-08	3.27E-08
HMO	7440-48-4	Cobalt and compounds	8.24E-08	8.24E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	7.21E-04	7.21E-04	1.98E-06	1.98E-06
HMO	7440-50-8	Copper and compounds	8.33E-07	8.33E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	7.30E-03	7.30E-03	2.00E-05	2.00E-05
HMO	53-70-3	Dibenz[a,h]anthracene	8.99E-10	8.99E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	7.88E-06	7.88E-06	2.16E-08	2.16E-08
HMO	100-41-4	Ethyl benzene	9.31E-06	9.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	8.16E-02	8.16E-02	2.24E-04	2.24E-04
HMO	206-44-0	Fluoranthene	1.17E-08	1.17E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.02E-04	1.02E-04	2.80E-07	2.80E-07
HMO	86-73-7	Fluorene	4.50E-09	4.50E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.94E-05	3.94E-05	1.08E-07	1.08E-07
HMO	50-00-0	Formaldehyde	7.26E-05	7.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	6.36E-01	6.36E-01	1.74E-03	1.74E-03
HMO	110-54-3	Hexane	1.76E-03	1.76E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.55E+01	1.55E+01	4.24E-02	4.24E-02
HMO	193-39-5	Indeno[1,2,3-cd]pyrene	1.15E-09	1.15E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.00E-05	1.00E-05	2.75E-08	2.75E-08
HMO	7439-96-5	Manganese and compounds	3.73E-07	3.73E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.26E-03	3.26E-03	8.94E-06	8.94E-06
HMO	7439-97-6	Mercury and compounds	2.55E-07	2.55E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.23E-03	2.23E-03	6.12E-06	6.12E-06
HMO	91-20-3	Naphthalene	1.09E-06	1.09E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.58E-03	9.58E-03	2.62E-05	2.62E-05
HMO	365	Nickel compounds, insoluble	2.06E-06	2.06E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.80E-02	1.80E-02	4.94E-05	4.94E-05
HMO	106-46-7	p-Dichlorobenzene (1,4-dichlorobenzene)	1.18E-06	1.18E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-02	1.03E-02	2.82E-05	2.82E-05
HMO	85-01-8	Phenanthrene	3.30E-08	3.30E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.89E-04	2.89E-04	7.93E-07	7.93E-07
HMO	115-07-1	Propylene	2.30E-04	2.30E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.02E+00	2.02E+00	5.52E-03	5.52E-03
HMO	129-00-0	Pyrene	5.49E-09	5.49E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.81E-05	4.81E-05	1.32E-07	1.32E-07
HMO	7782-49-2	Selenium and compounds	2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.06E-04	2.06E-04	5.65E-07	5.65E-07
HMO	108-88-3	Toluene	3.59E-05	3.59E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.14E-01	3.14E-01	8.61E-04	8.61E-04
HMO	7440-62-2	Vanadium (fume or dust)	2.25E-06	2.25E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.98E-02	1.98E-02	5.41E-05	5.41E-05
HMO	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.67E-05	2.67E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.34E-01	2.34E-01	6.40E-04	6.40E-04
HMO	7440-66-6	Zinc and compounds	2.84E-05	2.84E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.49E-01	2.49E-01	6.82E-04	6.82E-04
CKD	7440-38-2	Arsenic and compounds	4.63E-05	4.63E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	8.11E-02	8.11E-02	2.22E-04	2.22E-04
CKD	7440-41-7	Beryllium and compounds	3.27E-07	3.27E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	5.73E-04	5.73E-04	1.57E-06	1.57E-06
CKD	7440-43-9	Cadmium and compounds	6.00E-08	6.00E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.05E-04	1.05E-04	2.88E-07	2.88E-07
CKD	7440-48-4	Cobalt and compounds	4.26E-07	4.26E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	7.46E-04	7.46E-04	2.04E-06	2.04E-06
CKD	18540-29-9	Chromium VI, chromate and dichromate particulate	8.36E-06	8.36E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.46E-02	1.46E-02	4.01E-05	4.01E-05
CKD	7439-96-5	Manganese and compounds	2.28E-05	2.28E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.99E-02	3.99E-02	1.09E-04	1.09E-04
CKD	365	Nickel compounds, insoluble	1.39E-06	1.39E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.43E-03	2.43E-03	6.65E-06	6.65E-06
CKD	7439-92-1	Lead and compounds	1.94E-06	1.94E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.39E-03	3.39E-03	9.29E-06	9.29E-06
CKD	7440-36-0	Antimony and compounds	1.24E-05	1.24E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.18E-02	2.18E-02	5.97E-05	5.97E-05
CKD	7440-39-3	Barium and compounds	1.98E-04	1.98E-04	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.48E-01	3.48E-01	9.52E-04	9.52E-04
CKD	7440-50-8	Copper and compounds	5.34E-06	5.34E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	9.36E-03	9.36E-03	2.56E-05	2.56E-05
CKD	1313-27-5	Molybdenum trioxide	2.64E-06	2.64E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	4.62E-03	4.62E-03	1.27E-05	1.27E-05
CKD	7440-62-2	Vanadium (fume or dust)	4.82E-06	4.82E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	8.44E-03	8.44E-03	2.31E-05	2.31E-05
CKD	7440-66-6	Zinc and compounds	4.93E-06	4.93E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	8.64E-03	8.64E-03	2.37E-05	2.37E-05
CKD	7439-97-6	Mercury and compounds	2.37E-04	5.19E-04	lb/hr	See Process TAC and GHG Emissions Sheet, p. 11	2.08E+00	2.08E+00	1.25E-02	1.25E-02
CKD	7440-22-4	Silver and compounds	2.80E-06	2.80E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	4.91E-03	4.91E-03	1.34E-05	1.34E-05
CKD	7631-86-9	Silica, crystalline (respirable)	1.91E-01	1.91E-01	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.34E+02	3.34E+02	9.16E-01	9.16E-01
EW	7439-97-6	Mercury and compounds	5.77E-04	1.26E-03	lb/hr	See Process TAC and GHG Emissions Sheet, p. 11	5.05E+00	5.05E+00	3.03E-02	3.03E-02
EW	74-90-8	Cyanide, hydrogen	4.57E-03	4.57E-03	lb/hr	See HCN Monthly Sheet	4.00E+01	4.00E+01	1.10E-01	1.10E-01
MR	7439-97-6	Mercury and compounds	2.68E-05	1.96E-04	lb/hr	See Process TAC and GHG Emissions Sheet, p. 11	2.35E-01	2.35E-01	4.70E-03	4.70E-03
MFP	7440-38-2	Arsenic and compounds	1.69E-04	3.37E-04	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	7.88E-02	7.88E-02	1.52E-03	1.52E-03
MFP	7440-41-7	Beryllium and compounds	1.19E-06	2.38E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	5.57E-04	5.57E-04	1.07E-05	1.07E-05
MFP	7440-43-9	Cadmium and compounds	2.19E-07	4.37E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.02E-04	1.02E-04	1.97E-06	1.97E-06
MFP	7440-48-4	Cobalt and compounds	1.55E-06	3.10E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	7.26E-04	7.26E-04	1.40E-05	1.40E-05
MFP	18540-29-9	Chromium VI, chromate and dichromate particulate	3.05E-05	6.09E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.42E-02	1.42E-02	2.74E-04	2.74E-04
MFP	7439-96-5	Manganese and compounds	8.29E-05	1.66E-04	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.88E-02	3.88E-02	7.46E-04	7.46E-04
MFP	365	Nickel compounds, insoluble	5.05E-06	1.01E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.36E-03	2.36E-03	4.54E-05	4.54E-05
MFP	7439-92-1	Lead and compounds	7.05E-06	1.41E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.30E-03	3.30E-03	6.34E-05	6.34E-05
MFP	7440-36-0	Antimony and compounds	4.53E-05	9.06E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.12E-02	2.12E-02	4.07E-04	4.07E-04
MFP	7440-39-3	Barium and compounds	7.23E-04	1.45E-03	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.38E-01	3.38E-01	6.50E-03	6.50E-03
MFP	7440-50-8	Copper and compounds	1.95E-05	3.89E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	9.11E-03	9.11E-03	1.75E-04	1.75E-04
MFP	1313-27-5	Molybdenum trioxide	9.61E-06	1.92E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	4.49E-03	4.49E-03	8.64E-05	8.64E-05
MFP	7440-62-2	Vanadium (fume or dust)	1.75E-05	3.51E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	8.21E-03	8.21E-03	1.58E-04	1.58E-04
MFP	7440-66-6	Zinc and compounds	1.80E-05	3.59E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	8.41E-03	8.41E-03	1.62E-04	1.62E-04
MFP	7440-22-4	Silver and compounds	1.02E-05	2.04E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	4.78E-03	4.78E-03	9.18E-05	9.18E-05
MFHG	7439-97-6	Mercury and compounds	1.33E-03	1.73E-03	lb/hr	See Process TAC and GHG Emissions Sheet, p. 11	1.04E+00	1.04E+00	4.14E-02	4.14E-02
MFP	7631-86-9	Silica, crystalline (respirable)	6.95E-01	1.39E+00	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.25E+02	3.25E+02	6.25E+00	6.25E+00
UFD	7440-36-0	Antimony and compounds	4.35E-08	4.35E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	1.27E-02	1.27E-02	6.08E-05	6.08E-05
UFD	7440-38-2	Arsenic and compounds	1.58E-07	1.58E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	4.59E-02	4.59E-02	2.21E-04	2.21E-04
UFD	7440-41-7	Beryllium and compounds	1.20E-09	1.20E-09	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	3.50E-04	3.50E-04	1.68E-06	1.68E-06
UFD	7440-43-9	Cadmium and compounds	2.07E-10	2.07E-10	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	6.03E-05	6.03E-05	2.90E-07	2.90E-07
UFD	18540-29-9	Chromium VI, chromate and dichromate particulate	2.82E-08	2.82E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	8.22E-03	8.22E-03	3.95E-05	3.95E-05
UFD	7440-48-4	Cobalt and compounds	1.61E-09	1.61E-09	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	4.68E-04	4.68E-04	2.25E-06	2.25E-06
UFD	7439-92-1	Lead and compounds	6.84E-09	6.84E-09	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	1.99E-03	1.99E-03	9.58E-06	9.58E-06
UFD	7439-96-5	Manganese and compounds	8.05E-08	8.05E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	2.34E-02	2.34E-02	1.13E-04	1.13E-04
UFD	7439-97-6	Mercury and compounds	2.33E-09	2.33E-09	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	6.78E-04	6.78E-04	3.26E-06	3.26E-06
UFD	365	Nickel compounds, insoluble	4.75E-09	4.75E-09	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	1.38E-03	1.38E-03	6.65E-06	6.65E-06
UFD	7631-86-9	Silica, crystalline (respirable)	3.29E-04	3.29E-04	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	9.59E+01	9.59E+01	4.61E-01	4.61E-01
UFD	7440-39-3	Barium and compounds	6.90E-07	6.90E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	2.01E-01	2.01E-01	9.65E-04	9.65E-04
UFD	7440-50-8	Copper and compounds	1.75E-08	1.75E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	5.10E-03	5.10E-03	2.45E-05	2.45E-05
UFD	7440-62-2	Vanadium (fume or dust)	1.70E-08	1.70E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	4.95E-03	4.95E-03	2.38E-05	2.38E-05
UFD	7440-66-6	Zinc and compounds	1.72E-08	1.72E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	5.00E-03	5.00E-03	2.40E-05	2.40E-05
UFD	7440-22-4	Silver and compounds	8.84E-09	8.84E-09	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	2.57E-03	2.57E-03	1.24E-05	1.24E-05
UFD	1313-27-5	Molybdenum trioxide	8.84E-09	8.84E-09	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	2.57E-03	2.57E-03	1.24E-05	1.24E-05
AFD	7440-36-0	Antimony and compounds	5.81E-07	8.12E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	1.44E-01	1.44E-01	7.71E-04	7.71E-04
AFD	7440-38-2	Arsenic and compounds	1.79E-06	2.47E-06	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	4.42E-01	4.42E-01	2.34E-03	2.34E-03
AFD	7440-41-7	Beryllium and compounds	2.07E-08	2.94E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	5.12E-03	5.12E-03	2.79E-05	2.79E-05
AFD	7440-43-9	Cadmium and compounds	2.57E-09	3.56E-09	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	6.34E-04	6.34E-04	3.39E-06	3.39E-06
AFD	18540-29-9	Chromium VI, chromate and dichromate particulate	2.97E-07	4.06E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	7.33E-02	7.33E-02	3.86E-04	3.86E-04
AFD	7440-48-4	Cobalt and compounds	3.09E-08	4.41E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	7.64E-03	7.64E-03	4.19E-05	4.19E-05
AFD	7439-92-1	Lead and compounds	9.80E-08	1.38E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	2.42E-02	2.42E-02	1.31E-04	1.31E-04
AFD	7439-96-5	Manganese and compounds	1.15E-06	1.62E-06	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	2.84E-01	2.84E-01	1.53E-03	1.53E-03

AFD	7439-97-6	Mercury and compounds	2.95E-08	4.11E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	7.29E-03	7.29E-03	3.90E-05	3.90E-05
AFD	365	Nickel compounds, insoluble	5.59E-08	7.74E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	1.38E-02	1.38E-02	7.35E-05	7.35E-05
AFD	7631-86-9	Silica, crystalline (respirable)	4.01E-03	5.58E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	9.90E+02	9.90E+02	5.30E+00	5.30E+00
AFD	7440-39-3	Barium and compounds	8.90E-06	1.24E-05	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	2.20E+00	2.20E+00	1.18E-02	1.18E-02
AFD	7440-50-8	Copper and compounds	1.42E-07	1.89E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	3.50E-02	3.50E-02	1.79E-04	1.79E-04
AFD	7440-62-2	Vanadium (fume or dust)	2.41E-07	3.38E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	5.95E-02	5.95E-02	3.21E-04	3.21E-04
AFD	7440-66-6	Zinc and compounds	2.24E-07	3.13E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	5.54E-02	5.54E-02	2.97E-04	2.97E-04
AFD	7440-22-4	Silver and compounds	4.17E-08	5.08E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	1.03E-02	1.03E-02	4.83E-05	4.83E-05
AFD	1313-27-5	Molybdenum trioxide	8.78E-08	1.20E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	2.17E-02	2.17E-02	1.14E-04	1.14E-04
TSF	74-90-8	Cyanide, hydrogen	1.44E-01	1.83E-01	lb/hr	See HCN Monthly Sheet	1.26E+03	1.26E+03	4.40E+00	4.40E+00
POND	74-90-8	Cyanide, hydrogen	2.95E-02	4.36E-02	lb/hr	See HCN Monthly Sheet	2.58E+02	2.58E+02	1.05E+00	1.05E+00
LEACH1	74-90-8	Cyanide, hydrogen	4.78E-02	4.78E-02	lb/hr	See HCN Monthly Sheet	4.19E+02	4.19E+02	1.15E+00	1.15E+00
LEACH2	74-90-8	Cyanide, hydrogen	4.78E-02	4.78E-02	lb/hr	See HCN Monthly Sheet	4.19E+02	4.19E+02	1.15E+00	1.15E+00
CILTANK1	74-90-8	Cyanide, hydrogen	2.39E-02	2.39E-02	lb/hr	See HCN Monthly Sheet	2.09E+02	2.09E+02	5.74E-01	5.74E-01
CILTANK2	74-90-8	Cyanide, hydrogen	2.39E-02	2.39E-02	lb/hr	See HCN Monthly Sheet	2.09E+02	2.09E+02	5.74E-01	5.74E-01
CILTANK3	74-90-8	Cyanide, hydrogen	2.39E-02	2.39E-02	lb/hr	See HCN Monthly Sheet	2.09E+02	2.09E+02	5.74E-01	5.74E-01
CILTANK4	74-90-8	Cyanide, hydrogen	2.39E-02	2.39E-02	lb/hr	See HCN Monthly Sheet	2.09E+02	2.09E+02	5.74E-01	5.74E-01
CILTANK5	74-90-8	Cyanide, hydrogen	2.39E-02	2.39E-02	lb/hr	See HCN Monthly Sheet	2.09E+02	2.09E+02	5.74E-01	5.74E-01
CILTANK6	74-90-8	Cyanide, hydrogen	2.39E-02	2.39E-02	lb/hr	See HCN Monthly Sheet	2.09E+02	2.09E+02	5.74E-01	5.74E-01
CILTANK7	74-90-8	Cyanide, hydrogen	2.39E-02	2.39E-02	lb/hr	See HCN Monthly Sheet	2.09E+02	2.09E+02	5.74E-01	5.74E-01
CEM1	7440-38-2	Arsenic and compounds	1.42E-07	1.42E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	2.67E-03	2.67E-03	1.14E-05	1.14E-05
CEM1	7440-41-7	Beryllium and compounds	1.29E-08	1.29E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	2.43E-04	2.43E-04	1.04E-06	1.04E-06
CEM1	7440-43-9	Cadmium and compounds	4.06E-09	4.06E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	7.61E-05	7.61E-05	3.25E-07	3.25E-07
CEM1	18540-29-9	Chromium VI, chromate and dichromate particulate	1.94E-07	1.94E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	3.64E-03	3.64E-03	1.55E-05	1.55E-05
CEM1	7439-92-1	Lead and compounds	8.15E-08	8.15E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.53E-03	1.53E-03	6.52E-06	6.52E-06
CEM1	7439-96-5	Manganese and compounds	1.36E-07	1.36E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	2.55E-03	2.55E-03	1.09E-05	1.09E-05
CEM1	365	Nickel compounds, insoluble	3.52E-07	3.52E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	6.60E-03	6.60E-03	2.82E-05	2.82E-05
CEM1	12185-10-3	Phosphorus, white	6.94E-07	6.94E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.30E-02	1.30E-02	5.55E-05	5.55E-05
CEM1	7782-49-2	Selenium and compounds	1.00E-08	1.00E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.88E-04	1.88E-04	8.03E-07	8.03E-07
CEM1	7631-86-9	Silica, crystalline (respirable)	6.80E-06	6.80E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.27E-01	1.27E-01	5.44E-04	5.44E-04
CEM2	7440-38-2	Arsenic and compounds	1.42E-07	1.42E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	2.67E-03	2.67E-03	1.14E-05	1.14E-05
CEM2	7440-41-7	Beryllium and compounds	1.29E-08	1.29E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	2.43E-04	2.43E-04	1.04E-06	1.04E-06
CEM2	7440-43-9	Cadmium and compounds	4.06E-09	4.06E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	7.61E-05	7.61E-05	3.25E-07	3.25E-07
CEM2	18540-29-9	Chromium VI, chromate and dichromate particulate	1.94E-07	1.94E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	3.64E-03	3.64E-03	1.55E-05	1.55E-05
CEM2	7439-92-1	Lead and compounds	8.15E-08	8.15E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.53E-03	1.53E-03	6.52E-06	6.52E-06
CEM2	7439-96-5	Manganese and compounds	1.36E-07	1.36E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	2.55E-03	2.55E-03	1.09E-05	1.09E-05
CEM2	365	Nickel compounds, insoluble	3.52E-07	3.52E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	6.60E-03	6.60E-03	2.82E-05	2.82E-05
CEM2	12185-10-3	Phosphorus, white	6.94E-07	6.94E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.30E-02	1.30E-02	5.55E-05	5.55E-05
CEM2	7782-49-2	Selenium and compounds	1.00E-08	1.00E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.88E-04	1.88E-04	8.03E-07	8.03E-07
CEM2	7631-86-9	Silica, crystalline (respirable)	6.80E-06	6.80E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.27E-01	1.27E-01	5.44E-04	5.44E-04
CEM3	7440-38-2	Arsenic and compounds	9.84E-07	9.84E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.45E-01	2.45E-01	1.11E-03	1.11E-03
CEM3	7440-41-7	Beryllium and compounds	1.26E-08	1.26E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.14E-03	3.14E-03	1.42E-05	1.42E-05
CEM3	7440-43-9	Cadmium and compounds	1.45E-09	1.45E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.61E-04	3.61E-04	1.63E-06	1.63E-06
CEM3	7440-48-4	Cobalt and compounds	1.92E-08	1.92E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	4.78E-03	4.78E-03	2.16E-05	2.16E-05
CEM3	18540-29-9	Chromium VI, chromate and dichromate particulate	1.59E-07	1.59E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.96E-02	3.96E-02	1.79E-04	1.79E-04
CEM3	7439-97-6	Mercury and compounds	1.68E-08	1.68E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	4.17E-03	4.17E-03	1.89E-05	1.89E-05
CEM3	7439-96-5	Manganese and compounds	6.74E-07	6.74E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.68E-01	1.68E-01	7.58E-04	7.58E-04
CEM3	365	Nickel compounds, insoluble	3.11E-08	3.11E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	7.75E-03	7.75E-03	3.50E-05	3.50E-05
CEM3	7439-92-1	Lead and compounds	5.74E-08	5.74E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.43E-02	1.43E-02	6.46E-05	6.46E-05
CEM3	7440-36-0	Antimony and compounds	3.35E-07	3.35E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	8.34E-02	8.34E-02	3.77E-04	3.77E-04
CEM3	7440-39-3	Barium and compounds	5.08E-06	5.08E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.27E+00	1.27E+00	5.72E-03	5.72E-03
CEM3	7440-50-8	Copper and compounds	6.82E-08	6.82E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.70E-02	1.70E-02	7.67E-05	7.67E-05
CEM3	7440-62-2	Vanadium (fume or dust)	1.41E-07	1.41E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.50E-02	3.50E-02	1.58E-04	1.58E-04
CEM3	7440-66-6	Zinc and compounds	1.28E-07	1.28E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.20E-02	3.20E-02	1.44E-04	1.44E-04
CEM3	1313-27-5	Molybdenum trioxide	4.62E-08	4.62E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.15E-02	1.15E-02	5.19E-05	5.19E-05
CEM3	7440-22-4	Silver and compounds	1.29E-08	1.29E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.21E-03	3.21E-03	1.45E-05	1.45E-05
CEM3	7631-86-9	Silica, crystalline (respirable)	2.10E-03	2.10E-03	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	5.23E+02	5.23E+02	2.36E+00	2.36E+00
CEM4	7440-38-2	Arsenic and compounds	6.85E-07	6.85E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.70E-01	1.70E-01	7.70E-04	7.70E-04
CEM4	7440-41-7	Beryllium and compounds	8.78E-09	8.78E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.19E-03	2.19E-03	9.88E-06	9.88E-06
CEM4	7440-43-9	Cadmium and compounds	1.01E-09	1.01E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.51E-04	2.51E-04	1.13E-06	1.13E-06
CEM4	7440-48-4	Cobalt and compounds	1.33E-08	1.33E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.32E-03	3.32E-03	1.50E-05	1.50E-05
CEM4	18540-29-9	Chromium VI, chromate and dichromate particulate	1.11E-07	1.11E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.76E-02	2.76E-02	1.25E-04	1.25E-04
CEM4	7439-97-6	Mercury and compounds	1.17E-08	1.17E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.90E-03	2.90E-03	1.31E-05	1.31E-05
CEM4	7439-96-5	Manganese and compounds	4.69E-07	4.69E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.17E-01	1.17E-01	5.28E-04	5.28E-04
CEM4	365	Nickel compounds, insoluble	2.16E-08	2.16E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	5.39E-03	5.39E-03	2.44E-05	2.44E-05
CEM4	7439-92-1	Lead and compounds	3.99E-08	3.99E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	9.94E-03	9.94E-03	4.49E-05	4.49E-05
CEM4	7440-36-0	Antimony and compounds	2.33E-07	2.33E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	5.80E-02	5.80E-02	2.62E-04	2.62E-04
CEM4	7440-39-3	Barium and compounds	3.54E-06	3.54E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	8.80E-01	8.80E-01	3.98E-03	3.98E-03
CEM4	7440-50-8	Copper and compounds	4.74E-08	4.74E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.18E-02	1.18E-02	5.34E-05	5.34E-05
CEM4	7440-62-2	Vanadium (fume or dust)	9.79E-08	9.79E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.44E-02	2.44E-02	1.10E-04	1.10E-04
CEM4	7440-66-6	Zinc and compounds	8.93E-08	8.93E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.22E-02	2.22E-02	1.00E-04	1.00E-04
CEM4	1313-27-5	Molybdenum trioxide	3.21E-08	3.21E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	8.00E-03	8.00E-03	3.61E-05	3.61E-05
CEM4	7440-22-4	Silver and compounds	8.98E-09	8.98E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.24E-03	2.24E-03	1.01E-05	1.01E-05
CEM4	7631-86-9	Silica, crystalline (respirable)	1.78E-03	1.78E-03	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	4.43E+02	4.43E+02	2.00E+00	2.00E+00
CEM5	7440-38-2	Arsenic and compounds	2.96E-07	2.96E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	5.55E-03	5.55E-03	2.51E-05	2.51E-05
CEM5	7440-43-9	Cadmium and compounds	7.10E-10	7.10E-10	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.33E-05	1.33E-05	6.03E-08	6.03E-08
CEM5	18540-29-9	Chromium VI, chromate and dichromate particulate	1.27E-07	1.27E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	2.38E-03	2.38E-03	1.08E-05	1.08E-05
CEM5	7439-92-1	Lead and compounds	3.66E-08	3.66E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	6.86E-04	6.86E-04	3.11E-06	3.11E-06
CEM5	7439-96-5	Manganese and compounds	3.78E-06	3.78E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	7.08E-02	7.08E-02	3.21E-04	3.21E-04
CEM5	365	Nickel compounds, insoluble	2.48E-07	2.48E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	4.65E-03	4.65E-03	2.11E-05	2.11E-05
CEM5	12185-10-3	Phosphorus, white	1.60E-06	1.60E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	3.00E-02	3.00E-02	1.36E-04	1.36E-04
CEM5	7631-86-9	Silica, crystalline (respirable)	1.36E-05	1.28E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	2.55E-01	2.55E-01	1.09E-03	1.09E-03
UDP	106-99-0	1,3-Butadiene	1.59E-03	1.59E-03	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.57E+01	3.57E+01	1.72E-01	1.72E-01
UDP	83-32-9	Acenaphthene	2.45E-05	2.45E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.50E-01	5.50E-01	2.64E-03	2.64E-03
UDP	208-96-8	Acenaphthylene	2.97E-05	2.97E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.67E-01	6.67E-01	3.21E-03	3.21E-03
UDP	75-07-0	Acetaldehyde	5.72E-03	5.72E-03	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.29E+02	1.29E+02	6.18E-01	6.18E-01
UDP	107-02-8	Acrolein	2.47E-04	2.47E-04	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.56E+00	5.56E+00	2.68E-02	2.68E-02
UDP	7664-41-7	Ammonia	2.12E-02	2.12E-02	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	4.76E+02	4.76E+02	2.29E+00	2.29E+00
UDP	120-12-7	Anthracene	2.93E-05	2.93E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.59E-01	6.59E-01	3.17E-03	3.17E-03
UDP	7440-38-2	Arsenic and compounds	1.17E-05	1.17E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.63E-01	2.63E-01	1.26E-03	1.26E-03
UDP	71-43-2	Benzene	1.36E-03	1.36E-03	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.06E+01	3.06E+01	1.47E-01	1.47E-01
UDP	56-55-3	Benz[a]anthracene	2.85E-05	2.85E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.41E-01	6.41E-01	3.08E-03	3.08E-03
UDP	50-32-8	Benzo[a]pyrene	2.59E-07	2.59E-07	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.83E-03	5.83E-03	2.80E-05	2.80E-05
UDP	205-99-2	Benzo[b]fluoranthene	4.89E-05	4.89E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.10E+00	1.10E+00	5.29E-03	5.29E-03
UDP	191-24-2	Benzo[g,h,i]perylene	2.08E-08	2.08E-08	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	4.68E-04	4.68E-04	2.25E-06	2.25E-06
UDP	207-08-9	Benzo[k]fluoranthene	4.89E-05	4.89E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.10E+00	1.10E+00	5.29E-03	5.29E-03
UDP	7440-43-9	Cadmium and compounds	1.09E-05	1.09E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.46E-01	2.46E-01	1.18E-03	1.18E-03
UDP	108-90-7	Chlorobenzene	1.46E-06	1.46E-06	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.28E-02	3.28E-02	1.58E-04	1.58E-04
UDP	218-01-9	Chrysene	2.61E-05	2.61E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.87E-01	5.87E-01	2.82E-03	2.82E-03
UDP	7440-50-8	Copper and compounds	2.99E-05	2.99E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.73E-01	6.73E-01	3.24E-03	3.24E-03
UDP	53-70-3	Dibenz[a,h]anthracene	2.55E-05	2.55E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.73E-01	5.73E-01	2.76E-03	2.76E-03
UDP	100-41-4	Ethyl benzene	7.96E-05	7.96E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.79E+00	1.79E+00	8.60E-03	8.60E-03
UDP	206-44-0	Fluoranthene	2.92E-05	2.92E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.56E-01	6.56E-01	3.15E-03	3.15E-03
UDP	86-73-7	Fluorene	1.54E-04	1.54E-04	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.47E+00	3.47E+00	1.67E-02	1.67E-02
UDP	50-00-0	Formaldehyde	1.26E-02	1.26E-02	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.83E+02	2.83E+02	1.36E+00	1.36E+00

UDP	110-54-3	Hexane	1.96E-04	1.96E-04	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	4.42E+00	4.42E+00	2.12E-02	2.12E-02
UDP	7647-01-0	Hydrochloric acid	1.36E-03	1.36E-03	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.06E+01	3.06E+01	1.47E-01	1.47E-01
UDP	18540-29-9	Chromium VI, chromate and dichromate particulate	7.30E-07	7.30E-07	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.64E-02	1.64E-02	7.89E-05	7.89E-05
UDP	193-39-5	Indeno[1,2,3-cd]pyrene	2.53E-05	2.53E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.68E-01	5.68E-01	2.73E-03	2.73E-03
UDP	7439-92-1	Lead and compounds	6.06E-05	6.06E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.36E+00	1.36E+00	6.55E-03	6.55E-03
UDP	7439-96-5	Manganese and compounds	2.26E-05	2.26E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.09E-01	5.09E-01	2.45E-03	2.45E-03
UDP	7439-97-6	Mercury and compounds	1.46E-05	1.46E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.28E-01	3.28E-01	1.58E-03	1.58E-03
UDP	91-20-3	Naphthalene	1.44E-04	1.44E-04	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.23E+00	3.23E+00	1.55E-02	1.55E-02
UDP	365	Nickel compounds, insoluble	2.85E-05	2.85E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.40E-01	6.40E-01	3.08E-03	3.08E-03
UDP	85-01-8	Phenanthrene	2.85E-04	2.85E-04	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.40E+00	6.40E+00	3.08E-02	3.08E-02
UDP	115-07-1	Propylene	3.41E-03	3.41E-03	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	7.66E+01	7.66E+01	3.69E-01	3.69E-01
UDP	129-00-0	Pyrene	6.15E-05	6.15E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.38E+00	1.38E+00	6.65E-03	6.65E-03
UDP	7782-49-2	Selenium and compounds	1.61E-05	1.61E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.61E-01	3.61E-01	1.74E-03	1.74E-03
UDP	108-88-3	Toluene	7.69E-04	7.69E-04	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.73E+01	1.73E+01	8.32E-02	8.32E-02
UDP	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	3.09E-03	3.09E-03	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.96E+01	6.96E+01	3.35E-01	3.35E-01
UDP	7440-66-6	Zinc and compounds	1.64E-04	1.64E-04	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.68E+00	3.68E+00	1.77E-02	1.77E-02
UDP	200	Diesel particulate matter	2.45E-01	2.45E-01	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.50E+03	5.50E+03	2.64E+01	2.64E+01
EDG1	106-99-0	1,3-Butadiene	1.59E-03	1.59E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.98E+00	2.98E+00	7.15E-01	7.15E-01
EDG1	75-07-0	Acetaldehyde	5.72E-03	5.72E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	1.07E+01	1.07E+01	2.58E+00	2.58E+00
EDG1	107-02-8	Acrolein	2.47E-04	2.47E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	4.65E-01	4.65E-01	1.11E-01	1.11E-01
EDG1	7664-41-7	Ammonia	2.12E-02	2.12E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	3.97E+01	3.97E+01	9.54E+00	9.54E+00
EDG1	7440-38-2	Arsenic and compounds	1.17E-05	1.17E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.19E-02	2.19E-02	5.26E-03	5.26E-03
EDG1	71-43-2	Benzene	1.36E-03	1.36E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.55E+00	2.55E+00	6.13E-01	6.13E-01
EDG1	7440-43-9	Cadmium and compounds	1.09E-05	1.09E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.06E-02	2.06E-02	4.93E-03	4.93E-03
EDG1	108-90-7	Chlorobenzene	1.46E-06	1.46E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.74E-03	2.74E-03	6.58E-04	6.58E-04
EDG1	18540-29-9	Chromium VI, chromate and dichromate particulate	7.30E-07	7.30E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	1.37E-03	1.37E-03	3.29E-04	3.29E-04
EDG1	7440-50-8	Copper and compounds	2.99E-05	2.99E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	5.62E-02	5.62E-02	1.35E-02	1.35E-02
EDG1	200	Diesel particulate matter	8.98E-01	5.42E-01	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	1.69E+03	1.69E+03	2.44E+02	2.44E+02
EDG1	100-41-4	Ethyl benzene	7.96E-05	7.96E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	1.49E-01	1.49E-01	3.58E-02	3.58E-02
EDG1	50-00-0	Formaldehyde	1.26E-02	1.26E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.37E+01	2.37E+01	5.68E+00	5.68E+00
EDG1	110-54-3	Hexane	1.96E-04	1.96E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	3.69E-01	3.69E-01	8.85E-02	8.85E-02
EDG1	7439-92-1	Lead and compounds	6.06E-05	6.06E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	1.14E-01	1.14E-01	2.73E-02	2.73E-02
EDG1	7439-96-5	Manganese and compounds	2.26E-05	2.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	4.25E-02	4.25E-02	1.02E-02	1.02E-02
EDG1	7439-97-6	Mercury and compounds	1.46E-05	1.46E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.74E-02	2.74E-02	6.58E-03	6.58E-03
EDG1	91-20-3	Naphthalene	1.44E-04	1.44E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.70E-01	2.70E-01	6.48E-02	6.48E-02
EDG1	365	Nickel compounds, insoluble	2.85E-05	2.85E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	5.34E-02	5.34E-02	1.28E-02	1.28E-02
EDG1	83-32-9	Acenaphthene	2.45E-05	2.45E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	4.59E-02	4.59E-02	1.10E-02	1.10E-02
EDG1	208-96-8	Acenaphthylene	2.97E-05	2.97E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	5.57E-02	5.57E-02	1.34E-02	1.34E-02
EDG1	120-12-7	Anthracene	2.93E-05	2.93E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	5.50E-02	5.50E-02	1.32E-02	1.32E-02
EDG1	56-55-3	Benz[a]anthracene	2.85E-05	2.85E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	5.35E-02	5.35E-02	1.28E-02	1.28E-02
EDG1	50-32-8	Benzo[a]pyrene	2.59E-07	2.59E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	4.86E-04	4.86E-04	1.17E-04	1.17E-04
EDG1	205-99-2	Benzo[b]fluoranthene	4.89E-05	4.89E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	9.18E-02	9.18E-02	2.20E-02	2.20E-02
EDG1	191-24-2	Benzo[g,h,i]perylene	2.08E-08	2.08E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	3.91E-05	3.91E-05	9.37E-06	9.37E-06
EDG1	207-08-9	Benzo[k]fluoranthene	4.89E-05	4.89E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	9.18E-02	9.18E-02	2.20E-02	2.20E-02
EDG1	218-01-9	Chrysene	2.61E-05	2.61E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	4.90E-02	4.90E-02	1.18E-02	1.18E-02
EDG1	53-70-3	Dibenz[a,h]anthracene	2.55E-05	2.55E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	4.78E-02	4.78E-02	1.15E-02	1.15E-02
EDG1	206-44-0	Fluoranthene	2.92E-05	2.92E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	5.48E-02	5.48E-02	1.31E-02	1.31E-02
EDG1	86-73-7	Fluorene	1.54E-04	1.54E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.89E-01	2.89E-01	6.94E-02	6.94E-02
EDG1	193-39-5	Indeno[1,2,3-cd]pyrene	2.53E-05	2.53E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	4.74E-02	4.74E-02	1.14E-02	1.14E-02
EDG1	85-01-8	Phenanthrene	2.85E-04	2.85E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	5.34E-01	5.34E-01	1.28E-01	1.28E-01
EDG1	129-00-0	Pyrene	6.15E-05	6.15E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	1.15E-01	1.15E-01	2.77E-02	2.77E-02
EDG1	115-07-1	Propylene	3.41E-03	3.41E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	6.40E+00	6.40E+00	1.54E+00	1.54E+00
EDG1	7782-49-2	Selenium and compounds	1.61E-05	1.61E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	3.01E-02	3.01E-02	7.24E-03	7.24E-03
EDG1	108-88-3	Toluene	7.69E-04	7.69E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	1.44E+00	1.44E+00	3.47E-01	3.47E-01
EDG1	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	3.09E-03	3.09E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	5.81E+00	5.81E+00	1.39E+00	1.39E+00
EDG1	7440-66-6	Zinc and compounds	1.64E-04	1.64E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	3.07E-01	3.07E-01	7.37E-02	7.37E-02
EDG1	7647-01-0	Hydrochloric acid	1.36E-03	1.36E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.55E+00	2.55E+00	6.13E-01	6.13E-01
MFD	106-99-0	1,3-Butadiene	1.08E-04	1.08E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	5.05E-02	5.05E-02	4.86E-04	4.86E-04
MFD	91-57-6	2-Methyl naphthalene	1.02E-06	1.02E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	4.78E-04	4.78E-04	4.60E-06	4.60E-06
MFD	83-32-9	Acenaphthene	1.54E-06	1.54E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	7.21E-04	7.21E-04	6.93E-06	6.93E-06
MFD	208-96-8	Acenaphthylene	4.74E-07	4.74E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	2.22E-04	2.22E-04	2.13E-06	2.13E-06
MFD	75-07-0	Acetaldehyde	2.56E-03	2.56E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.20E+00	1.20E+00	1.15E-02	1.15E-02
MFD	107-02-8	Acrolein	2.56E-03	2.56E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.20E+00	1.20E+00	1.15E-02	1.15E-02
MFD	7664-41-7	Ammonia	2.12E-02	2.12E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	9.90E+00	9.90E+00	9.52E-02	9.52E-02
MFD	120-12-7	Anthracene	1.74E-07	1.74E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	8.16E-05	8.16E-05	7.85E-07	7.85E-07
MFD	7440-38-2	Arsenic and compounds	1.17E-05	1.17E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	5.46E-03	5.46E-03	5.25E-05	5.25E-05
MFD	71-43-2	Benzene	3.21E-05	3.21E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.50E-02	1.50E-02	1.44E-04	1.44E-04
MFD	56-55-3	Benz[a]anthracene	9.85E-08	9.85E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	4.61E-05	4.61E-05	4.43E-07	4.43E-07
MFD	50-32-8	Benzo[a]pyrene	5.51E-08	5.51E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	2.58E-05	2.58E-05	2.48E-07	2.48E-07
MFD	205-99-2	Benzo[b]fluoranthene	4.87E-08	4.87E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	2.28E-05	2.28E-05	2.19E-07	2.19E-07
MFD	192-97-2	Benzo[e]pyrene	1.02E-07	1.02E-07	lb/MMBtu	p-Dichlorobenzene (1,4-Dichlorobenzene)	4.78E-05	4.78E-05	4.60E-07	4.60E-07
MFD	191-24-2	Benzo[g,h,i]perylene	6.20E-08	6.20E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	2.90E-05	2.90E-05	2.79E-07	2.79E-07
MFD	207-08-9	Benzo[k]fluoranthene	6.07E-07	6.07E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	2.84E-04	2.84E-04	2.73E-06	2.73E-06
MFD	7440-43-9	Cadmium and compounds	1.09E-05	1.09E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	5.12E-03	5.12E-03	4.93E-05	4.93E-05
MFD	108-90-7	Chlorobenzene	1.46E-06	1.46E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	6.83E-04	6.83E-04	6.57E-06	6.57E-06
MFD	218-01-9	Chrysene	9.34E-08	9.34E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	4.37E-05	4.37E-05	4.20E-07	4.20E-07
MFD	7440-50-8	Copper and compounds	2.99E-05	2.99E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.40E-02	1.40E-02	1.35E-04	1.35E-04
MFD	53-70-3	Dibenz[a,h]anthracene	4.74E-08	4.74E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	2.22E-05	2.22E-05	2.13E-07	2.13E-07
MFD	100-41-4	Ethyl benzene	1.46E-06	1.46E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	6.83E-04	6.83E-04	6.57E-06	6.57E-06
MFD	206-44-0	Fluoranthene	2.42E-07	2.42E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.13E-04	1.13E-04	1.09E-06	1.09E-06
MFD	86-73-7	Fluorene	8.54E-07	8.54E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	4.00E-04	4.00E-04	3.84E-06	3.84E-06
MFD	50-00-0	Formaldehyde	2.56E-03	2.56E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.20E+00	1.20E+00	1.15E-02	1.15E-02
MFD	110-54-3	Hexane	2.55E-05	2.55E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.20E-02	1.20E-02	1.15E-04	1.15E-04
MFD	7647-01-0	Hydrochloric acid	1.36E-03	1.36E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	6.36E-01	6.36E-01	6.12E-03	6.12E-03
MFD	18540-29-9	Chromium VI, chromate and dichromate particulate	7.30E-07	7.30E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	3.42E-04	3.42E-04	3.28E-06	3.28E-06
MFD	193-39-5	Indeno[1,2,3-cd]pyrene	4.85E-08	4.85E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	2.27E-05	2.27E-05	2.18E-07	2.18E-07
MFD	7439-92-1	Lead and compounds	6.06E-05	6.06E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	2.83E-02	2.83E-02	2.73E-04	2.73E-04
MFD	7439-96-5	Manganese and compounds	2.26E-05	2.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.06E-02	1.06E-02	1.02E-04	1.02E-04
MFD	7439-97-6	Mercury and compounds	1.46E-05	1.46E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	6.83E-03	6.83E-03	6.57E-05	6.57E-05
MFD	91-20-3	Naphthalene	3.87E-05	3.87E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.81E-02	1.81E-02	1.74E-04	1.74E-04
MFD	365	Nickel compounds, insoluble	2.85E-05	2.85E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.33E-02	1.33E-02	1.28E-04	1.28E-04
MFD	198-55-0	Perylene	1.98E-07	1.98E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	9.26E-05	9.26E-05	8.90E-07	8.90E-07
MFD	85-01-8	Phenanthrene	2.72E-06	2.72E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.27E-03	1.27E-03	1.22E-05	1.22E-05
MFD	115-07-1	Propylene	7.30E-05	7.30E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	3.42E-02	3.42E-02	3.28E-04	3.28E-04
MFD	129-00-0	Pyrene	2.98E-07	2.98E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.39E-04	1.39E-04	1.34E-06	1.34E-06
MFD	7782-49-2	Selenium and compounds	1.61E-05	1.61E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	7.51E-03	7.51E-03	7.22E-05	7.22E-05
MFD	108-88-3	Toluene	3.21E-05	3.21E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.50E-02	1.50E-02	1.44E-04	1.44E-04
MFD	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	1.17E-05	1.17E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	5.46E-03	5.46E-03	5.25E-05	5.25E-05
MFD	7440-66-6	Zinc and compounds	1.64E-04	1.64E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	7.65E-02	7.65E-02	7.36E-04	7.36E-04
EDFP	106-99-0	1,3-Butadiene	1.59E-03	1.59E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.98E-01	2.98E-01	7.15E-02	7.15E-02
EDFP	75-07-0	Acetaldehyde	5.72E-03	5.72E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	1.07E+00	1.07E+00	2.58E-01	2.58E-01
EDFP	107-02-8	Acrolein	2.47E-04	2.47E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	4.65E-02	4.65E-02	1.11E-02	1.11E-02
EDFP	7664-41-7	Ammonia	2.12E-02	2.12E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	3.97E+00	3.97E+00	9.54E-01	9.54E-01
EDFP	7440-38-2	Arsenic and compounds	1.17E-05	1.17E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.19E-03	2.19E-03	5.26E-04	5.26E-04
EDFP	71-43-2	Benzene	1.36E-03	1.36E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.55E-01	2.55E-01	6.13E-02	6.13E-02

EDFP	7440-43-9	Cadmium and compounds		1.09E-05	1.09E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		2.06E-03	2.06E-03		4.93E-04	4.93E-04				
EDFP	108-90-7	Chlorobenzene		1.46E-06	1.46E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		2.74E-04	2.74E-04		6.58E-05	6.58E-05				
EDFP	18540-29-9	Chromium VI, chromate and dichromate particulate		7.30E-07	7.30E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		1.37E-04	1.37E-04		3.29E-05	3.29E-05				
EDFP	7440-50-8	Copper and compounds		2.99E-05	2.99E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		5.62E-03	5.62E-03		1.35E-03	1.35E-03				
EDFP	200	Diesel particulate matter		8.98E-01	5.42E-01	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		1.69E+02	1.69E+02		2.44E+01	2.44E+01				
EDFP	100-41-4	Ethyl benzene		7.96E-05	7.96E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		1.49E-02	1.49E-02		3.58E-03	3.58E-03				
EDFP	50-00-0	Formaldehyde		1.26E-02	1.26E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		2.37E+00	2.37E+00		5.68E-01	5.68E-01				
EDFP	110-54-3	Hexane		1.96E-04	1.96E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		3.69E-02	3.69E-02		8.85E-03	8.85E-03				
EDFP	7439-92-1	Lead and compounds		6.06E-05	6.06E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		1.14E-02	1.14E-02		2.73E-03	2.73E-03				
EDFP	7439-96-5	Manganese and compounds		2.26E-05	2.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		4.25E-03	4.25E-03		1.02E-03	1.02E-03				
EDFP	7439-97-6	Mercury and compounds		1.46E-05	1.46E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		2.74E-03	2.74E-03		6.58E-04	6.58E-04				
EDFP	91-20-3	Naphthalene		1.44E-04	1.44E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		2.70E-02	2.70E-02		6.48E-03	6.48E-03				
EDFP	365	Nickel compounds, insoluble		2.85E-05	2.85E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		5.34E-03	5.34E-03		1.28E-03	1.28E-03				
EDFP	83-32-9	Acenaphthene		2.45E-05	2.45E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		4.59E-03	4.59E-03		1.10E-03	1.10E-03				
EDFP	208-96-8	Acenaphthylene		2.97E-05	2.97E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		5.57E-03	5.57E-03		1.34E-03	1.34E-03				
EDFP	120-12-7	Anthracene		2.93E-05	2.93E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		5.50E-03	5.50E-03		1.32E-03	1.32E-03				
EDFP	56-55-3	Benz[a]anthracene		2.85E-05	2.85E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		5.35E-03	5.35E-03		1.28E-03	1.28E-03				
EDFP	50-32-8	Benzo[a]pyrene		2.59E-07	2.59E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		4.86E-05	4.86E-05		1.17E-05	1.17E-05				
EDFP	205-99-2	Benzo[b]fluoranthene		4.89E-05	4.89E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		9.18E-03	9.18E-03		2.20E-03	2.20E-03				
EDFP	191-24-2	Benzo[g,h,i]perylene		2.08E-08	2.08E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		3.91E-06	3.91E-06		9.37E-07	9.37E-07				
EDFP	207-08-9	Benzo[k]fluoranthene		4.89E-05	4.89E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		9.18E-03	9.18E-03		2.20E-03	2.20E-03				
EDFP	218-01-9	Chrysene		2.61E-05	2.61E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		4.90E-03	4.90E-03		1.18E-03	1.18E-03				
EDFP	53-70-3	Dibenz[a,h]anthracene		2.55E-05	2.55E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		4.78E-03	4.78E-03		1.15E-03	1.15E-03				
EDFP	206-44-0	Fluoranthene		2.92E-05	2.92E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		5.48E-03	5.48E-03		1.31E-03	1.31E-03				
EDFP	86-73-7	Fluorene		1.54E-04	1.54E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		2.89E-02	2.89E-02		6.94E-03	6.94E-03				
EDFP	193-39-5	Indeno[1,2,3-cd]pyrene		2.53E-05	2.53E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		4.74E-03	4.74E-03		1.14E-03	1.14E-03				
EDFP	85-01-8	Phenanthrene		2.85E-04	2.85E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		5.34E-02	5.34E-02		1.28E-02	1.28E-02				
EDFP	129-00-0	Pyrene		6.15E-05	6.15E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		1.15E-02	1.15E-02		2.77E-03	2.77E-03				
EDFP	115-07-1	Propylene		3.41E-03	3.41E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		6.40E-01	6.40E-01		1.54E-01	1.54E-01				
EDFP	7782-49-2	Selenium and compounds		1.61E-05	1.61E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		3.01E-03	3.01E-03		7.24E-04	7.24E-04				
EDFP	108-88-3	Toluene		7.69E-04	7.69E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		1.44E-01	1.44E-01		3.47E-02	3.47E-02				
EDFP	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		3.09E-03	3.09E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		5.81E-01	5.81E-01		1.39E-01	1.39E-01				
EDFP	7440-66-6	Zinc and compounds		1.64E-04	1.64E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		3.07E-02	3.07E-02		7.37E-03	7.37E-03				
EDFP	7647-01-0	Hydrochloric acid		1.36E-03	1.36E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		2.55E-01	2.55E-01		6.13E-02	6.13E-02				
LS1	7631-86-9	Silica, crystalline (respirable)		3.40E-09	3.40E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12		1.12E-06	1.12E-06		1.87E-07	1.87E-07				
LS2	7631-86-9	Silica, crystalline (respirable)		0.000000028	2.80E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12		9.20E-06	9.20E-06		2.52E-08	2.52E-08				
TG1	71-43-2	Benzene		0.000277845	0.000277845		See Tank Emission Calculations Sheet, p. 1		3.33E+01	3.33E+01		9.13E-02	9.13E-02				
TG1	92-52-4	Biphenyl		1.54E-06	1.54E-06		See Tank Emission Calculations Sheet, p. 1		1.85E-01	1.85E-01		5.07E-04	5.07E-04				
TG1	110-82-7	Cyclohexane		0.000037046	0.000037046		See Tank Emission Calculations Sheet, p. 1		4.45E+00	4.45E+00		1.22E-02	1.22E-02				
TG1	100-41-4	Ethyl benzene		0.000247745	0.000247745		See Tank Emission Calculations Sheet, p. 1		2.97E+01	2.97E+01		8.15E-02	8.15E-02				
TG1	110-54-3	Hexane		0.00110181	0.00110181		See Tank Emission Calculations Sheet, p. 1		1.32E+02	1.32E+02		3.62E-01	3.62E-01				
TG1	91-20-3	Naphthalene		6.85E-05	6.85E-05		See Tank Emission Calculations Sheet, p. 1		8.22E+00	8.22E+00		2.25E-02	2.25E-02				
TG1	108-95-2	Phenol		8.49E-06	8.49E-06		See Tank Emission Calculations Sheet, p. 1		1.02E+00	1.02E+00		2.79E-03	2.79E-03				
TG1	108-88-3	Toluene		0.001113232	0.001113232		See Tank Emission Calculations Sheet, p. 1		1.34E+02	1.34E+02		3.66E-01	3.66E-01				
TG1	95-63-6	1,2,4-Trimethylbenzene		0.000385896	0.000385896		See Tank Emission Calculations Sheet, p. 1		4.63E+01	4.63E+01		1.27E-01	1.27E-01				
TG1	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		0.001106749	0.001106749		See Tank Emission Calculations Sheet, p. 1		1.33E+02	1.33E+02		3.64E-01	3.64E-01				
TG1	98-82-8	Isopropylbenzene (cumene)		7.72E-05	7.72E-05		See Tank Emission Calculations Sheet, p. 1		9.26E+00	9.26E+00		2.54E-02	2.54E-02				
TD1	71-43-2	Benzene		2.86E-10	2.86E-10		See Tank Emission Calculations Sheet, p. 1		6.87E-05	6.87E-05		1.88E-07	1.88E-07				
TD1	92-52-4	Biphenyl		3.41E-08	3.41E-08		See Tank Emission Calculations Sheet, p. 1		8.18E-03	8.18E-03		2.24E-05	2.24E-05				
TD1	100-41-4	Ethyl benzene		4.43E-09	4.43E-09		See Tank Emission Calculations Sheet, p. 1		1.06E-03	1.06E-03		2.91E-06	2.91E-06				
TD1	110-54-3	Hexane		3.41E-07	3.41E-07		See Tank Emission Calculations Sheet, p. 1		8.18E-02	8.18E-02		2.24E-04	2.24E-04				
TD1	91-20-3	Naphthalene		1.87E-07	1.87E-07		See Tank Emission Calculations Sheet, p. 1		4.50E-02	4.50E-02		1.23E-04	1.23E-04				
TD1	85-01-8	Phenanthrene		4.26E-08	4.26E-08		See Tank Emission Calculations Sheet, p. 1		1.02E-02	1.02E-02		2.80E-05	2.80E-05				
TD1	108-95-2	Phenol		2.18E-08	2.18E-08		See Tank Emission Calculations Sheet, p. 1		5.24E-03	5.24E-03		1.43E-05	1.43E-05				
TD1	100-42-5	Styrene		1.09E-08	1.09E-08		See Tank Emission Calculations Sheet, p. 1		2.62E-03	2.62E-03		7.17E-06	7.17E-06				
TD1	108-88-3	Toluene		1.09E-08	1.09E-08		See Tank Emission Calculations Sheet, p. 1		2.62E-03	2.62E-03		7.17E-06	7.17E-06				
TD1	95-63-6	1,2,4-Trimethylbenzene		3.41E-07	3.41E-07		See Tank Emission Calculations Sheet, p. 1		8.18E-02	8.18E-02		2.24E-04	2.24E-04				
TD1	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		9.88E-08	9.88E-08		See Tank Emission Calculations Sheet, p. 1		2.37E-02	2.37E-02		6.50E-05	6.50E-05				
TD1	7439-97-6	Mercury and compounds		1.36E-11	1.36E-11		See Tank Emission Calculations Sheet, p. 1		3.27E-06	3.27E-06		8.96E-09	8.96E-09				
TD2	71-43-2	Benzene		4.82E-10	4.82E-10		See Tank Emission Calculations Sheet, p. 1		7.22E-06	7.22E-06		1.98E-08	1.98E-08				
TD2	92-52-4	Biphenyl		5.73E-08	5.73E-08		See Tank Emission Calculations Sheet, p. 1		8.60E-04	8.60E-04		2.36E-06	2.36E-06				
TD2	100-41-4	Ethyl benzene		7.45E-09	7.45E-09		See Tank Emission Calculations Sheet, p. 1		1.12E-04	1.12E-04		3.06E-07	3.06E-07				
TD2	110-54-3	Hexane		5.73E-07	5.73E-07		See Tank Emission Calculations Sheet, p. 1		8.60E-03	8.60E-03		2.36E-05	2.36E-05				
TD2	91-20-3	Naphthalene		3.15E-07	3.15E-07		See Tank Emission Calculations Sheet, p. 1		4.73E-03	4.73E-03		1.30E-05	1.30E-05				
TD2	85-01-8	Phenanthrene		7.17E-08	7.17E-08		See Tank Emission Calculations Sheet, p. 1		1.08E-03	1.08E-03		2.95E-06	2.95E-06				
TD2	108-95-2	Phenol		3.67E-08	3.67E-08		See Tank Emission Calculations Sheet, p. 1		5.50E-04	5.50E-04		1.51E-06	1.51E-06				
TD2	100-42-5	Styrene		1.83E-08	1.83E-08		See Tank Emission Calculations Sheet, p. 1		2.75E-04	2.75E-04		7.54E-07	7.54E-07				
TD2	108-88-3	Toluene		1.83E-08	1.83E-08		See Tank Emission Calculations Sheet, p. 1		2.75E-04	2.75E-04		7.54E-07	7.54E-07				
TD2	95-63-6	1,2,4-Trimethylbenzene		5.73E-07	5.73E-07		See Tank Emission Calculations Sheet, p. 1		8.60E-03	8.60E-03		2.36E-05	2.36E-05				
TD2	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		1.66E-07	1.66E-07		See Tank Emission Calculations Sheet, p. 1		2.49E-03	2.49E-03		6.83E-06	6.83E-06				
TD2	7439-97-6	Mercury and compounds		2.29E-11	2.29E-11		See Tank Emission Calculations Sheet, p. 1		3.44E-07	3.44E-07		9.42E-10	9.42E-10				

INSERT ROWS ABOVE THIS LINE **INSERT ROWS ABOVE THIS LINE** **INSERT ROWS ABOVE THIS LINE** **INSERT ROWS ABOVE THIS LI**

INSTRUCTIONS:
- **Toxic Emissions Unit and Stack/Fugitive ID**: use IDs consistent with permit identifiers if applicable.
- **Emission Units or Activity Description:** where possible, maintain consistency with permitted/reported Units/Type.
- **Material Name:** this is the commercial name that is provided on the manufacturer's SDS.
- **Material Waste:** this category should be used to account for all waste material shipped off-site, lost to drain, or incorporated into product.
- **Max Daily Activity:** for semi-continuous/batch processes this value should account for co-occurring activities, process and/or maintenance, that would account for the potential maximum emissions activities for this pollutant.
  - **Actual:** values should be based on the last full year reported to DEQ, or estimates of normal activity (new sources).
  - **Capacity:** maximum activity value achievable with 100% operational up-time for this activity.
  - **Requested PTE:** values that a source is requesting to be permitted on that differ from "Actuals" and "Capacity".

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Emissions Unit/Product Information				Stack/Fugitive Information		Material Usage						Material Waste					
						Annual - Chronic [lb/year]			Max Daily - Acute [lb/day]			Annual - Chronic [lb/year]			Max Daily - Acute [lb/day]		
Toxics Emissions Unit ID	Emission Unit or Activity Description	Material Name	Manufacturer	Emission Type (e.g. Point or Fugitive)	Stack or Fugitive ID	Actual	Requested PTE	Capacity	Actual	Requested PTE	Capacity	Actual	Requested PTE	Capacity	Actual	Requested PTE	Capacity
TEU-Booth	Widget Paint Booth - atomizer spray guns (EXAMPLE)	Widget Paint-A	Widget Paint Co.	Point	ST-4	12,000	14,000	20,000	36	40	52	2000	2600	5000	5	7	14
TEU-Booth	Widget Paint Booth - atomizer spray guns (EXAMPLE)	Widget Paint-B	Widget Paint Co.	Point	ST-4	950	1200	1500	5	10	15	15	30	40	0.5	1	2
N/A																	

INSTRUCTIONS:

- **Material Name**: must be consistent with **Material Name** on "*Material Balance Activities*" worksheet *Column C*.
- **CAS or DEQ ID**: either use the drop-down provided or simply cut and paste each pollutant CAS number or DEQ ID (see the DEQ Pollutant List worksheet) emitted by the referenced TEU.
- **Chemical Name:** if a CAS number or DEQ ID is entered in *Column C*, *Column D* should perform a lookup from the DEQ Air Toxics list; alternatively, simply cut and paste the chemical names that correspond to the CAS numbers/DEQ ID in *Column C* if applicable.
- **Control Efficiency:** enter the pollutant specific control efficiency - this should include all capture and removal process efficiencies applicable to each individual pollutant.
- **Percent Composition:** provide raw percent composition values for the pollutant as reported by supporting manufacturer documentation.
- **Reference/Notes:** provide references and notes for control efficiencies and/or any adjustments applied to material usage data via **Material Waste** (*Columns M-R*) on the "*Material Balance Activities*" worksheet.
- **Calculated Emissions:** follow guidance in "*Form Instructions*" worksheet for specific formulas.

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				Emissions Data			Calculated Emissions					
							Annual Emissions - Chronic [lb/yr]			Total Daily Emissions - Acute [lb/day]		
Unit ID	Material Name	CAS or DEQ ID	Chemical Name	Control Efficiency	Percent Composition	Reference/Notes	Actual	Requested PTE	Capacity	Actual	Requested PTE	Capacity
TEU-BOOTH	Widget Paint-A	67-56-1	Methanol	0.00%	35.00%		3500	3990	5250	10.85	11.55	13.3
TEU-BOOTH	Widget Paint-A	100-40-3	4-Vinylcyclohexene	0.00%	48.00%		4800	5472	7200	14.88	15.84	18.24
TEU-BOOTH	Widget Paint-A	18540-29-9	Chromium VI, chromate and dichromate particulate	99.72%	5.00%	Includes Transfer Efficiency (72%) and Filter Remova	1.4	1.596	2.1	0.00434	0.00462	0.00532
TEU-BOOTH	Widget Paint-B	90-43-7	2-Phenylphenol	0.00%	0.50%		4.675	5.85	7.3	0.0225	0.045	0.065
TEU-BOOTH	Widget Paint-B	50-00-0	Formaldehyde	0.00%	70.00%		654.5	819	1022	3.15	6.3	9.1
TEU-BOOTH	Widget Paint-B	7440-36-0	Antimony and compounds	99.72%	5.00%	Includes Transfer Efficiency (72%) and Filter Remova	0.1309	0.1638	0.2044	0.00063	0.00126	0.00182
N/A												

CATEGORICALLY EXEMPT TOXICS EMISSIONS UNITS **ANSWER SHEET**

Facility name: Grassy Mountain Permit Number:

Indicate which of the following categorically exempt activities occur at this facility by checking the appropriate columns below. Submit this form electronically with your Cleaner Air Oregon (CAO) Emissions Inventory AQ520 form to meet the reporting requirements in OAR 340-245-0040(4)(a)(A) for categorically exempt Toxics Emissions Units (TEUs). This form is the complete list of categorically exempt TEUs, which can be found in the division 245 rules under OAR 340-245-0060(3)(b).

Yes	No	Categorically Exempt TEU Activities
☑	☐	Evaporative and tail pipe emissions from on-site motor vehicle operation.
☐	☑	Distillate oil, kerosene, gasoline, natural gas or propane burning equipment, provided the aggregate expected actual emissions of the equipment identified does not exceed the de minimis level for any regulated pollutant, based on the expected maximum annual operation of the equipment. If a source's expected emissions from all such equipment exceed the de minimis levels, then the source may identify a subgroup of such equipment as categorically exempt with the remainder not designated as an exempt TEU. The following equipment may never be included as part of the exempt TEU: A. Any individual distillate oil, kerosene or gasoline burning equipment with a rating greater than 0.4 million Btu/hour; and B. Any individual natural gas or propane burning equipment with a rating greater than 2.0 million Btu/hour.
☐	☑	Distillate oil, kerosene, gasoline, natural gas or propane burning equipment brought on site for six months or less for maintenance, construction or similar purposes, such as but not limited to generators, pumps, hot water pressure washers and space heaters, provided that any such equipment that performs the same function as the permanent equipment, must be operated within the source's existing PSEL.
☐	☑	Office activities.
☐	☑	Food service activities.
☑	☐	Janitorial activities.
☐	☑	Personal care activities.
☑	☐	Grounds keeping activities, including, but not limited to building painting and road and parking lot maintenance.
☐	☑	On-site laundry activities.
☐	☑	On-site recreation facilities.
☐	☑	Instrument calibration.
☑	☐	Automotive storage garages.

☑	☐	Refrigeration systems with less than 50 pounds of charge of ozone depleting substances regulated under Title VI, including pressure tanks used in refrigeration systems but excluding any combustion equipment associated with such systems.
☑	☐	Temporary construction activities.
☑	☐	Warehouse activities.
☑	☐	Accidental fires and fire suppression.
☐	☑	Air vents from compressors.
☐	☑	Air purification systems.
☐	☑	Continuous emissions monitoring lines.
☐	☑	Demineralized water tanks.
☐	☑	Pre-treatment of municipal water, including use of deionized water purification systems.
☐	☑	Electrical charging stations.
☐	☑	Fire brigade training.
☐	☑	Instrument air dryers and distribution.
☐	☑	Fully enclosed process raw water filtration systems.
☑	☐	Electric motors.
☑	☐	Pressurized tanks containing gaseous compounds that do not contain toxic air contaminants.
☐	☑	Vacuum sheet stacker vents.
☐	☑	Emissions from wastewater discharges to publicly owned treatment works (POTW) provided the source is authorized to discharge to the POTW, not including on-site wastewater treatment and/or holding facilities.
☐	☑	Log ponds.
☑	☐	Stormwater settling basins.
☐	☑	Paved roads and paved parking lots within an urban growth boundary.
☑	☐	Hazardous air pollutant emissions in fugitive dust from paved and unpaved roads except for those sources that have processes or activities that contribute to the deposition and entrainment of hazardous air pollutants from surface soils.
☑	☐	Health, safety, and emergency response activities.
☐	☑	Non-diesel, compression ignition emergency generators* and pumps used only during loss of primary equipment or utility service due to circumstances beyond the

		reasonable control of the owner or operator, or to address a power emergency, provided that the aggregate horsepower rating of all stationary emergency generator and pump engines is not more than 3,000 horsepower. If the aggregate horsepower rating of all the stationary emergency generator and pump engines is more than 3,000 horsepower, then no emergency generators and pumps at the source may be considered categorically exempt. ***All spark ignition engines remain exempt.**
☐	☑	Non-contact steam vents and leaks and safety and relief valves for boiler steam distribution systems.
☐	☑	Non-contact steam condensate flash tanks.
☐	☑	Non-contact steam vents on condensate receivers, deaerators and similar equipment.
☐	☑	Boiler blowdown tanks.
☐	☑	Ash piles maintained in a wetted condition and associated handling systems and activities.

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Grassy Mountain Mine Air Quality Modeling Protocol and Risk Assessment Work Plan

PREPARED FOR:
CALICO RESOURCES USA CORP.

PROJECT NO. 343-1
AUGUST 1, 2022

1.0 INTRODUCTION

Calico Resources is providing this Modeling Protocol and Risk Assessment Work Plan to support its request for a Standard Air Contaminant Discharge Permit (ACDP) for the proposed Grassy Mountain Mine facility (facility). The facility will be located approximately 24 kilometers south southwest of Adrian, Oregon, in Malheur County. A location map for the facility is presented in Figure 1. As part of the Standard ACDP application, it is expected that the facility will be required to demonstrate compliance under the Cleaner Air Oregon program (CAO). This report presents a toxic air contaminant (TAC) emissions inventory, Risk Assessment Work Plan (RAWP), and modeling protocol to establish the basis for a CAO Level 3 Risk Assessment.

The Modeling Protocol in Section 2.0 presents the methods used for an air quality evaluation of the potential air emissions from Facility sources. The dispersion model (AERMOD), modeling techniques, source characterizations and emissions, the receptors, the meteorological dataset, the background concentrations, and the ambient air quality standards are described in the Protocol. The accompanying RAWP in Section 3.0 includes a conceptual site model, the proposed exposure assessment and risk characterization using AERMOD, and an uncertainty evaluation.

1.1 Facility Process Description

The Project will consist of an underground gold and silver ore mine using the Drift and Fill mining method, and a process facility to mill, refine, and melt gold and silver ore into doré bars for further processing off-site.

The underground mine will be developed using drill and blast techniques. A main ramp will be established from the portal to the bottom level. A level access will be mined from the main ramp to the production area. As ore is removed from the production area, cemented rockfill (CRF) or rockfill will be placed to fill the production drifts eliminating voids in the production area. The rock used in the CRF or rockfill will come from a nearby borrow pit or the waste rock storage facility. The CRF will require a backfill batch plant at the surface. A mobile crushing unit located in the borrow pit will crush borrow pit material. The crushed rock from the borrow pit will be hauled to the backfill batch plant and used for CRF or hauled directly underground for rockfill. Material from the waste rock storage facility may also be hauled to the backfill batch plant to be used as CRF or hauled directly underground to be used as rockfill.

Economic material from the underground mine will be hauled using underground trucks from the production area to a stockpile on surface. A front-end loader will take the material from the stockpile to a mobile crushing unit that will include a jaw crusher as the primary stage, a screen and a secondary cone crusher for further size reduction. Crushed ore is then conveyed to a fine-ore bin, which is then transferred to the mill via a feed conveyor; from here, the process is a wet

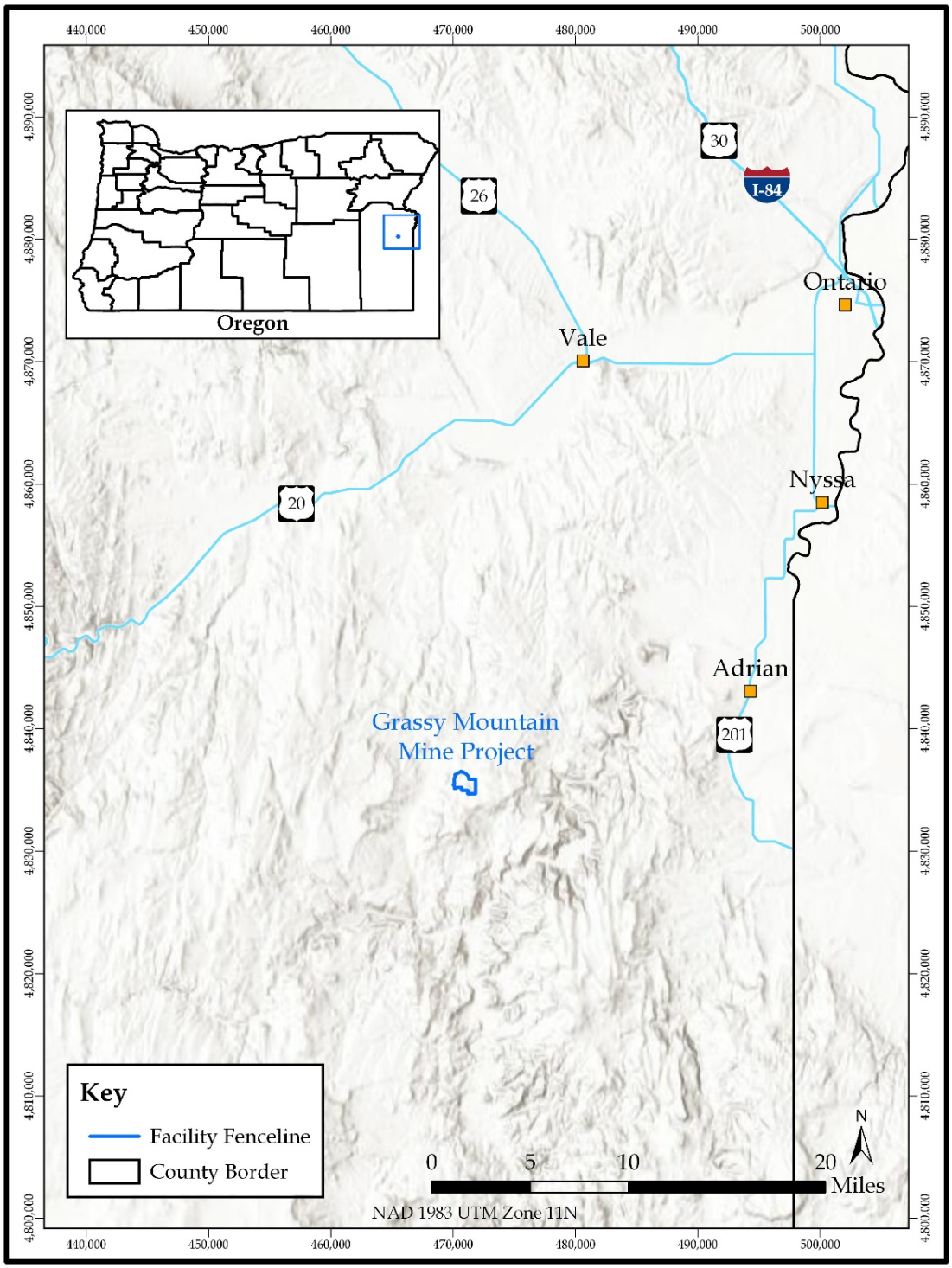
process. The crushed ore will be ground by a ball mill in closed circuit with a hydro-cyclone cluster. The hydro-cyclone overflow will flow to a leach/ carbon-in-leach (CIL) circuit via a pre-aeration tank. Lime is added during pre-aeration to control pH, and cyanide is added to the first leach tank. The leach/CIL circuit consists of a pre-aeration tank, 2 leach tanks and a series of 7 CIL tanks.

Leached gold and silver will be adsorbed onto activated granular carbon, which is present in all CIL tanks. Slurry advances through each of the 7 CIL tanks. Barren carbon is added to the last tank and flows through the circuit in the opposite direction to the slurry: loaded carbon extracted for the elution process is removed from CIL tank 1. The elution process strips gold and silver from the carbon into solution. Pregnant solution (solution loaded with gold and silver) is transferred to the gold room, and stripped carbon is regenerated in the propane-fired carbon regeneration kiln before being recycled to the CIL circuit. Some carbon loss occurs during heating in the kiln, and new carbon is added along with regenerated carbon to CIL tank 7.

The gold room will house the electrowinning cells, retort, barring furnace, and associated support equipment. In the electrowinning cells, gold and silver are plated onto cathodes using electrolysis. Periodically, the electrowinning cells will be opened, and the sludge cleaned out manually with a high-pressure spray gun. Sludge from the cells will flow by gravity to the electrowinning-sludge-filter feed tank and pumped through a filter press to be dewatered. Dewatered sludge is to be collected in trays and placed in the mercury retort to dry the sludge and remove mercury. Dried sludge will be removed from the retort and combined with fluxes in a flux mixer before being charged into the melting furnace, where the sludge is melted and poured into doré bars.

The CIL tailings will be pumped to an agitated cyanide detoxification tank, where lime will be added to buffer pH, copper sulfate will be added as a reaction catalyst, and sodium metabisulfite will be added. Detoxified slurry will overflow from the detoxification tank to the tailings pump box where it will be pumped to the tailings management facility by the tailings pumps.

Figure 1. Facility Location Map



2.0 MODELING PROTOCOL

2.1 Model Selection

The analysis will be conducted using version 21112 of the AERMOD modeling system. The AERMOD modeling system is the recommended model for short-range analyses (up to 50 kilometers) in the Guideline on Air Quality Models, which is maintained by the United States Environmental Protection Agency (EPA) and published as Appendix W to the Code of Federal Regulations, Title 40, Part 51.

Regulatory default options in AERMOD will be used to estimate the ground-level concentrations for the PM_{10} standard and TACs.

2.2 Modeled Sources

This analysis will include evaluation of potential emissions from all sources identified in the ACDP application at the facility. Emission sources include exhaust stacks (generators, silo vents, heaters, and process sources) as well as fugitive emission sources (blasting, hauling, material handling, crushing, and conveying). Fugitive emissions of Toxic Air Contaminants (TACs), which include Hazardous Air Pollutants (HAPs), from several additional sources were modeled, including the tailings management facility, tailings pond, fuel storage tanks, and CIL process tanks.

A complete list of modeled sources and descriptions is provided in Appendix A.

2.3 Source Characterization and Model Input Parameters

The model input parameters for each source are presented in Appendix A. A facility plot plan showing the project boundary and layout of sources is provided in Figure 2; a closer view of the refinery is shown in Figure 3. For references and additional details regarding source characterization, the reader is referred to Appendix E, Emissions Inventory Worksheets.

2.3.1 Volume and Point Sources

All the sources with stacks included in this protocol will be characterized as POINT sources in the model. An exhaust temperature of 0˚K will be used for sources not associated with heated processes (e.g., silo vents). AERMOD substitutes a 0˚K exhaust temperature with the hourly ambient temperature provided in the meteorological data for dispersion calculations.

All process fugitive sources without a stack (e.g., crushing) will be characterized as VOLUME sources. The initial lateral and vertical dispersion parameters will be calculated based on approximate source dimensions and coefficients provided in EPA guidance.[1]

2.3.2 Underground Mining Sources

Emissions from underground mining activities include fugitive dust from drilling, blasting, and materials handling, and tailpipe emissions from nonroad mobile equipment. Tailpipe emissions from nonroad engines are included in the CAO risk analysis at the request of Oregon Department of Environmental Quality (ODEQ). The inclusion of these emissions results in a highly conservative analysis because, 1) nonroad engines are excluded from the definition of "stationary sources"[2] and 2) states are preempted from enforcing emission control standards for nonroad engines.[3] .

The MSHA-compliant ventilation system continuously draws fresh air into the mine and exhausts "stale" air from a single vent at the surface. This vent will be characterized as a single POINT source located at and use stack parameters consistent with the ventilation system design.

2.3.3 Haul Road Source Characterization

The Project's haul road emissions are from fugitive dust source and nonroad mobile tailpipes. Nonroad mobile tailpipe emissions are not stationary sources and therefore are exempt from consideration under the CAO program (see Section 2.3.2). Fugitive dust from unpaved roads is considered categorically insignificant per OAR 340-200-0020 (23)(ss). Therefore, emissions from haul roads are not included in the TAC emissions inventory for CAO and will not be included in the TAC modeling for CAO. However, fugitive haul road dust emissions and mobile tailpipe emissions may be considered for the air quality permit application and therefore the proposed characterization of the haul road emission sources follows.

Aboveground road-way emissions from on-site hauling and water truck activity will be characterized as LINE sources. The LINE source in AERMOD is a type of AREA source. The LINE source release heights will be based on the mobile equipment heights, and the sources' widths based on planned road widths, consistent with the recommendations for AREA sources

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[1] EPA. 2016. User's Guide for the AMS/EPA Regulatory Model (AERMOD). EPA-454/B-16-011. December 2016.

[2] 42 U.S.C. §7602(z) Stationary Source.—The term "stationary source" means generally any source of an air pollutant except those emissions resulting directly from an internal combustion engine for transportation purposes or from a nonroad engine or nonroad vehicle as defined in section 7550 of this title.

[3] 40 CFR § 1074.10 Scope of preemption. (b) For nonroad engines or vehicles other than those described in paragraph (a) of this section and § 1074.12, States and localities are preempted from enforcing any standards or other requirements relating to control of emissions from nonroad engines or vehicles except as provided in subpart B of this part.

described by EPA's Haul Road Workgroup[4]. The Haul Road Workgroup generally recommends the use of adjacent VOLUME sources for haul road emissions. For this project, however, the haul roads are sufficiently distant from the facility boundary such that the characterization is not expected to make a substantial difference in impacts, and the use of LINE sources instead of adjacent VOLUME sources will reduce the total number of sources and model run times. Haul roads modeled in complex terrain as LINE or AREA sources typically result in higher modeled impacts compared to the same roads modeled as VOLUME sources, so the characterization should be considered conservative.

2.3.4 Area Sources

Several fugitive emissions sources will be characterized as AREA sources, including wind erosion emissions at the topsoil storage locations; general mining activity across the borrow site; and TAC emissions from the tailings management facility, a tailings reclaim pond, the carbon-in-leach (CIL) tanks, and cyanide detoxification tanks. For these sources whose emission location extents are not rectangular, the AREA sources will be characterized as rectangular approximations of the locations.

2.4 Insignificant Sources

Categorically insignificant sources are listed in Table 1. The "Source ID" column identifies sources included in the emission inventory worksheets or characterized in Figure 2 but not considered significant TEU's. Details about each source were taken from "Grassy Mountain Project, Oregon, USA, NI 43-101 Technical Report on Feasibility Study" prepared by Ausenco (2020) unless otherwise noted. The completed Form AQ523 is included as Appendix E.

[4] EPA 2012. "Haul Road Workgroup Final Report Submission to EPA-OAQPS." Memorandum from Tyler Fox (EPA Air Quality Modeling Group Leader) to Regional Office Modeling Contacts, March 2, 2012.

Table 1. Categorically Insignificant Sources List

Source ID	Source Description	Details
N/A	Evaporative and tail pipe emissions from on-site motor vehicle operation	Aboveground nonroad vehicles.
N/A	Office activities	Administration building: Single level modular wood frame, 80 x 110 ft. Will be serviced with power, water, air conditioning and heating, communications. Contractor office and laydown: Modular trailer with an area of 160 ft^2
N/A	Janitorial activities	Routine janitorial activities will be occurring as needed.
N/A	Grounds keeping activities, but not limited to building painting and road and parking lot maintenance	Seasonal road maintenance is anticipated to be sufficient to provide initial access to the site for all personnel and any deliveries related to the mine site and construction. The road will be upgraded for year-round activities during mine construction.
N/A	Automotive storage garages	Truck workshop and warehouse: Pre-engineered steel-frame and metal-clad building with an area of 6,250 ft^2. Will be positioned adjacent to the min-office building. Will be divided into two sections, one for warehousing spare parts and tool storage and the other for a maintenance workshop. A bridge crane will be included.
N/A	Refrigeration systems with less than 50 pounds of charge of ozone depleting substances regulated under Title IV	Not specifically identified but may be present
N/A	Temporary construction activities	Construction period of 18 months beginning March 1st, 2022 to build Tailings Storage and Waste Rock Dump Facilities
N/A	Warehouse activities	Process plant workshop and warehouse: Metal clad building approximately 2,540 ft^2.
N/A	Accidental fires and fire suppression	Fire Safety Systems (FSS). Fire suppression, detection, and protection systems
N/A	Electric motors	These have not been specifically identified but are anticipated to be present
N/A	Pressurized tanks containing gaseous compounds	These have not been specifically identified but may be present in the workshop or laboratory.
N/A	Storm water settling basins	Storm Water Pollution Prevention Plan (EPA) will be in place. The portal pad was designed with a 1% inclination toward outside, to allow storm water to flow away from the portal and toward the storm water drainage ditches.

Source ID	Source Description	Details
HR	Hazardous air pollutant emissions in fugitive dust from paved and unpaved roads except for those sources that have processes or activities that contribute to the deposition and entertainment of hazardous air pollutants from surface soil	Borrow pit haul roads: 1.02 mi. Underground hauling: 1.62 mi. Process area hauling: 0.89 mi.
N/A	Health, safety, and emergency response activities	Two mobile emergency refuge stations will be provided in case of fire or rockfalls that would block access and prevent full evacuation of personnel. These refuges will allow the staff to remain safe in the underground mine for 48 hours. Each can accommodate up to 20 people within the protected chamber.

2.5 Coordinate System

The Universal Transverse Mercator (UTM) coordinate system projected in North American Datum of 1983 (NAD83), Zone 11, will be used in the modeling analysis to define all locations in the modeling domain (sources, buildings, and receptors).

2.6 Building Downwash

The effects of the building-induced downwash will be incorporated into this modeling analysis (see Figure 4 for a 3D perspective of the modeled building layout). The building downwash parameters will be calculated using the Building Profile Input Program (BPIP) with the Plume Rise Model Enhancement (PRIME) algorithm (BPIP-PRIME version 04274). The building parameters used in the modeling are provided in a BPIP-ready format in Appendix B.

Figure 2. Model Source Locations for Grassy Mountain Mine Facility

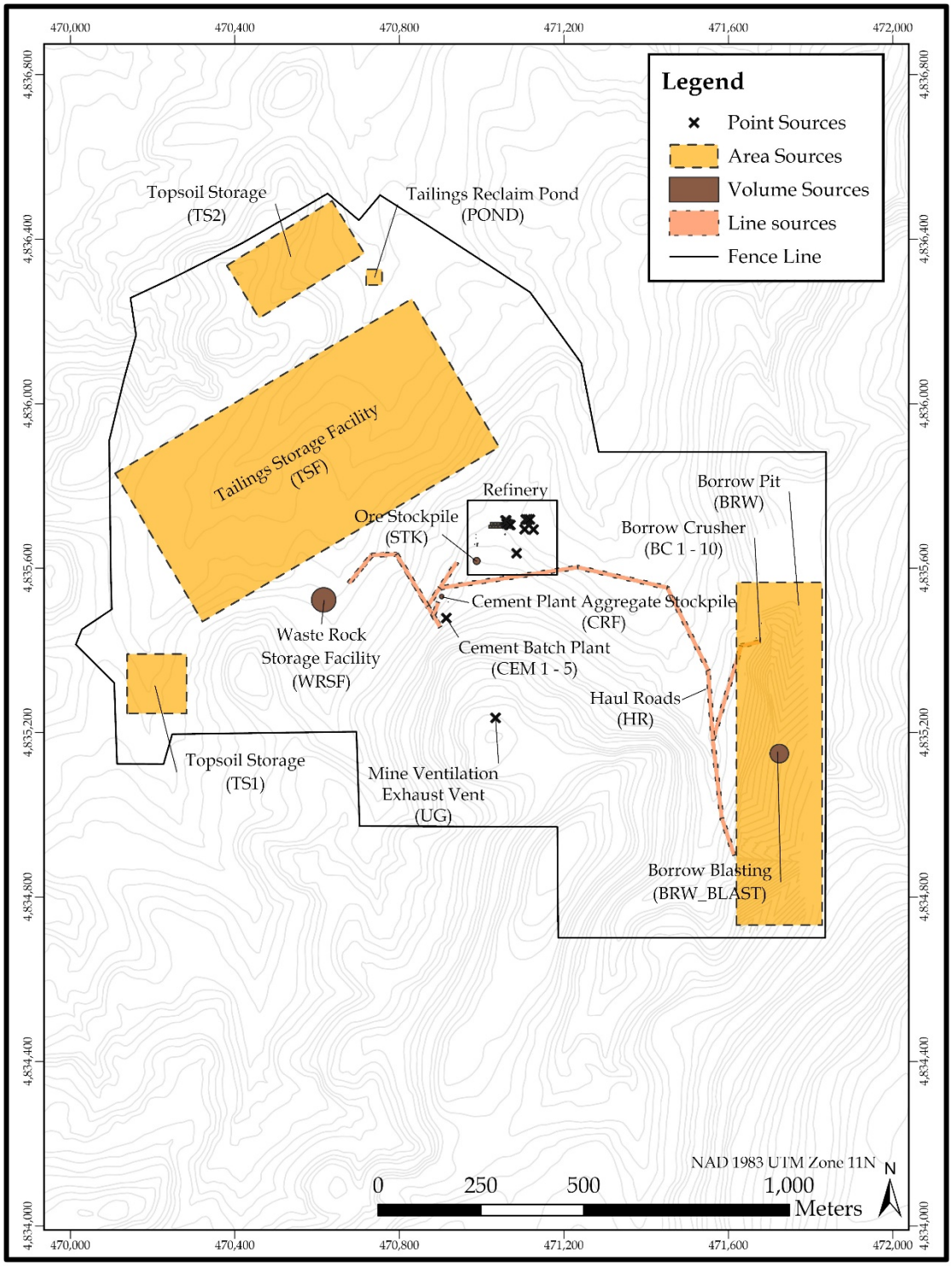


Figure 3. Model Source Locations for Grassy Mountain Mine Refinery

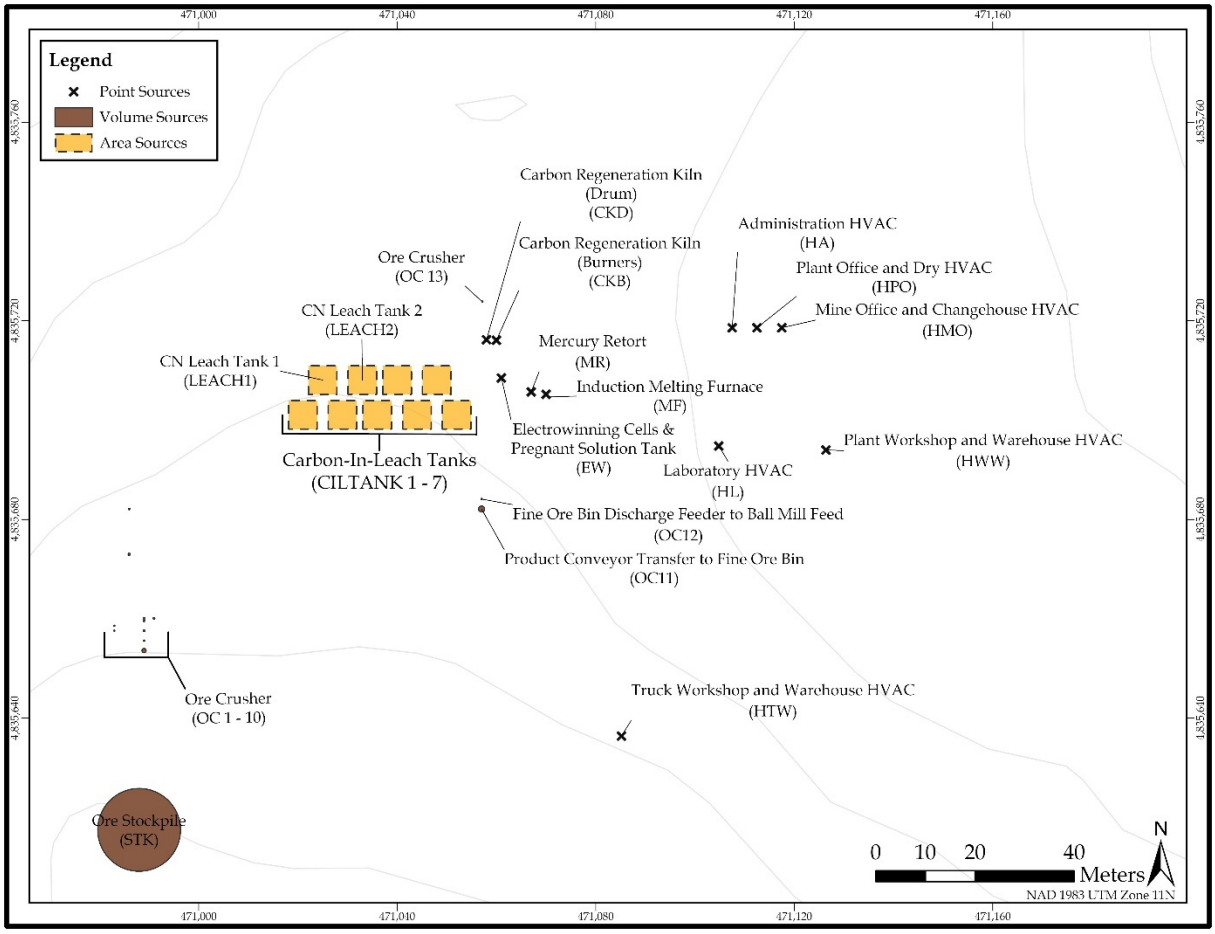
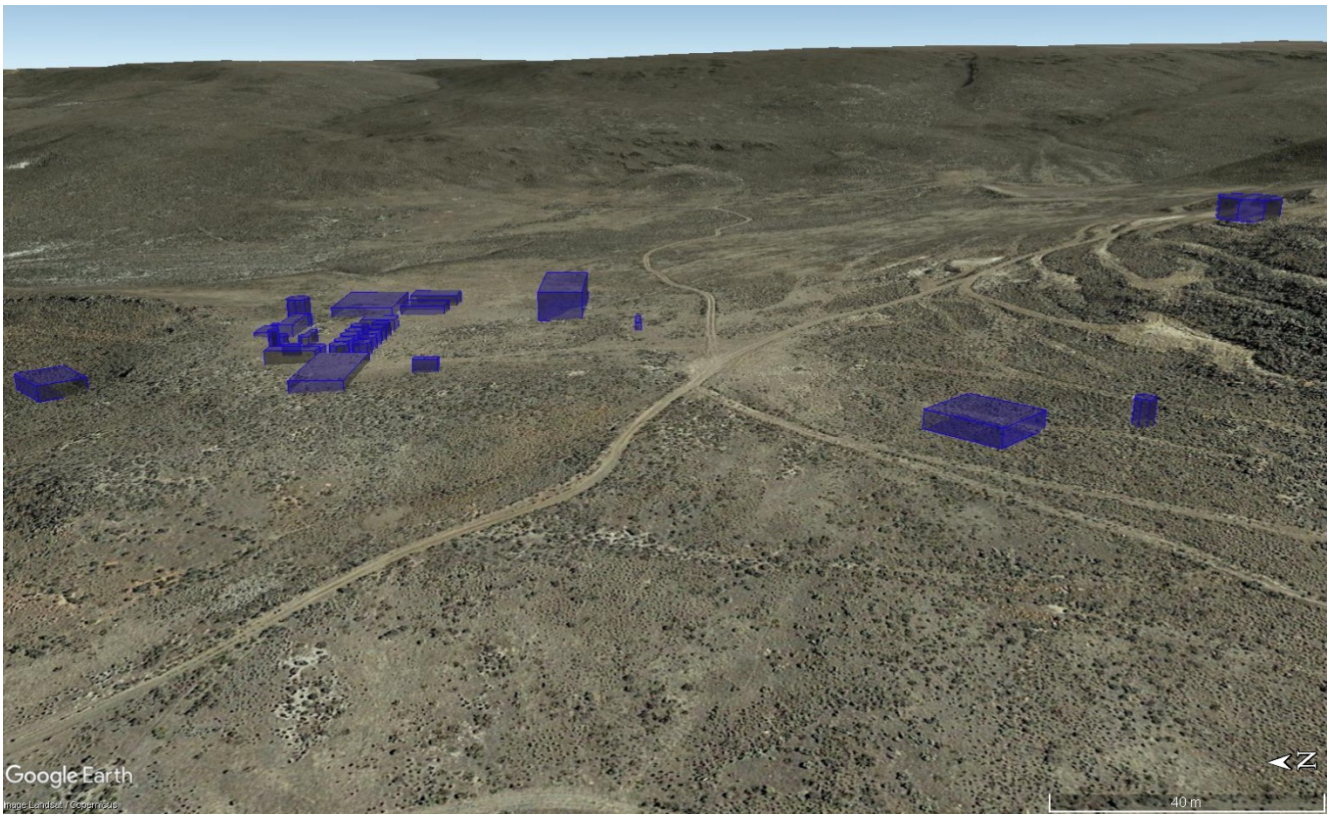


Figure 4. Perspective View of Refinery Area Model Buildings Included for Downwash



2.7 Receptors

A series of nested Cartesian receptor grids will be used to assess ground-level impacts from the facility air emissions:

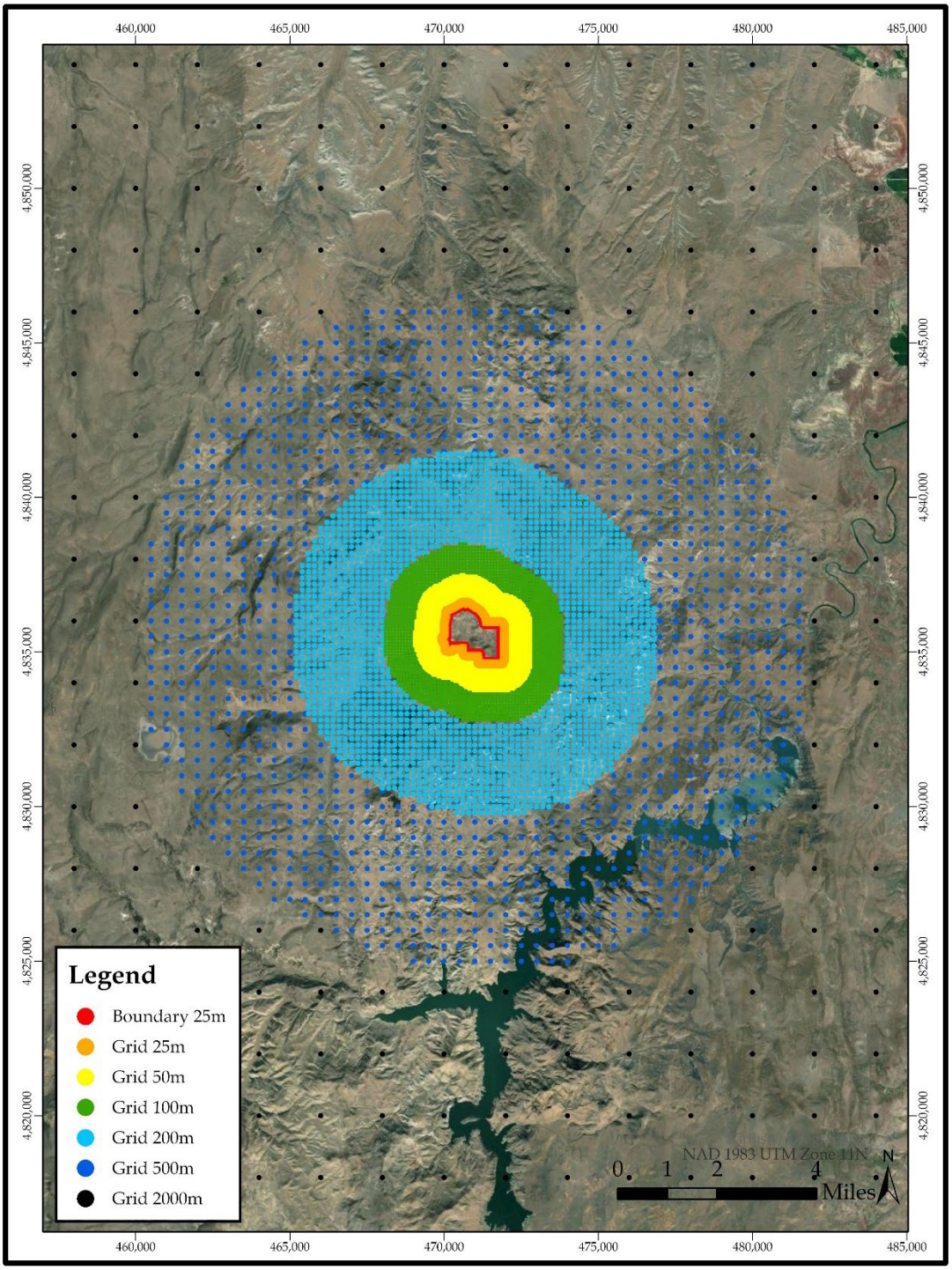
- Boundary line receptors at 25-meter spacing
- Gridded receptors at 25-meter spacing out to 200 meters from the modeling boundary
- Gridded receptors at 50-meter spacing out to 1 kilometer from the modeling boundary
- Gridded receptors at 100-meter spacing out to 2 kilometers from the modeling boundary
- Gridded receptors at 200-meter spacing out to 5 kilometers from the modeling boundary
- Gridded receptors at 500-meter spacing to 10 kilometers from the modeling boundary
- Gridded receptors at 2-kilometer spacing to 50 kilometers from the modeling boundary

All the above grids will be centered on the facility. Receptors within the project boundary will not be modeled. The receptor locations are shown in Figure 5. Additional receptors will be modeled for the risk assessment and are discussed in Section 3.0.

All receptors will be processed with the AERMOD terrain preprocessor (AERMAP, version 18081) to generate receptor terrain elevations and hill height values using the one-third-arc-

second (10-meter) resolution United States Geographical Survey National Elevation Dataset (NED) files.

Figure 5. Receptor Locations

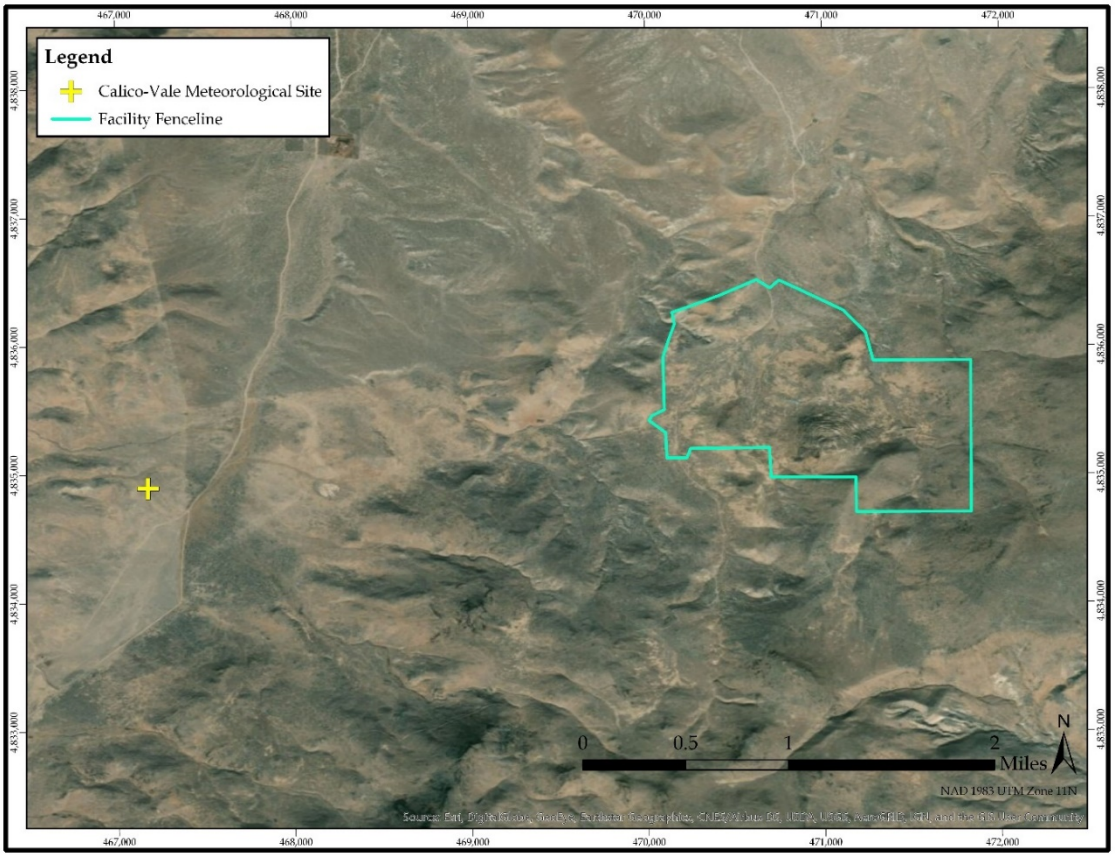


2.8 Meteorological Data

The air quality modeling will be conducted using one year (2014/10/1–2015/9/30) of site-specific hourly meteorological data. The meteorological data were collected at the Calico-Vale meteorological station as part of the Air Quality Baseline study for the facility project area (Baseline Study)[5]. The site is located approximately four kilometers west of the facility project area, as shown in Figure 6. A wind frequency distribution diagram (wind rose) for the meteorological data is presented in Figure 7. The data quality meets or exceeds all specifications described in the Environmental Protection Agency's (EPA's) Meteorological Monitoring Guidance for Regulatory Modeling Applications[6].

The data set will be processed with AERMET version 21112, supplemented with upper-air data from Boise, ID, and National Weather Service (NWS) surface station data, including cloud cover, from Ontario, OR. The processing will include the AERMET stage 3 adjusted surface friction velocity option (ADJ_U*).

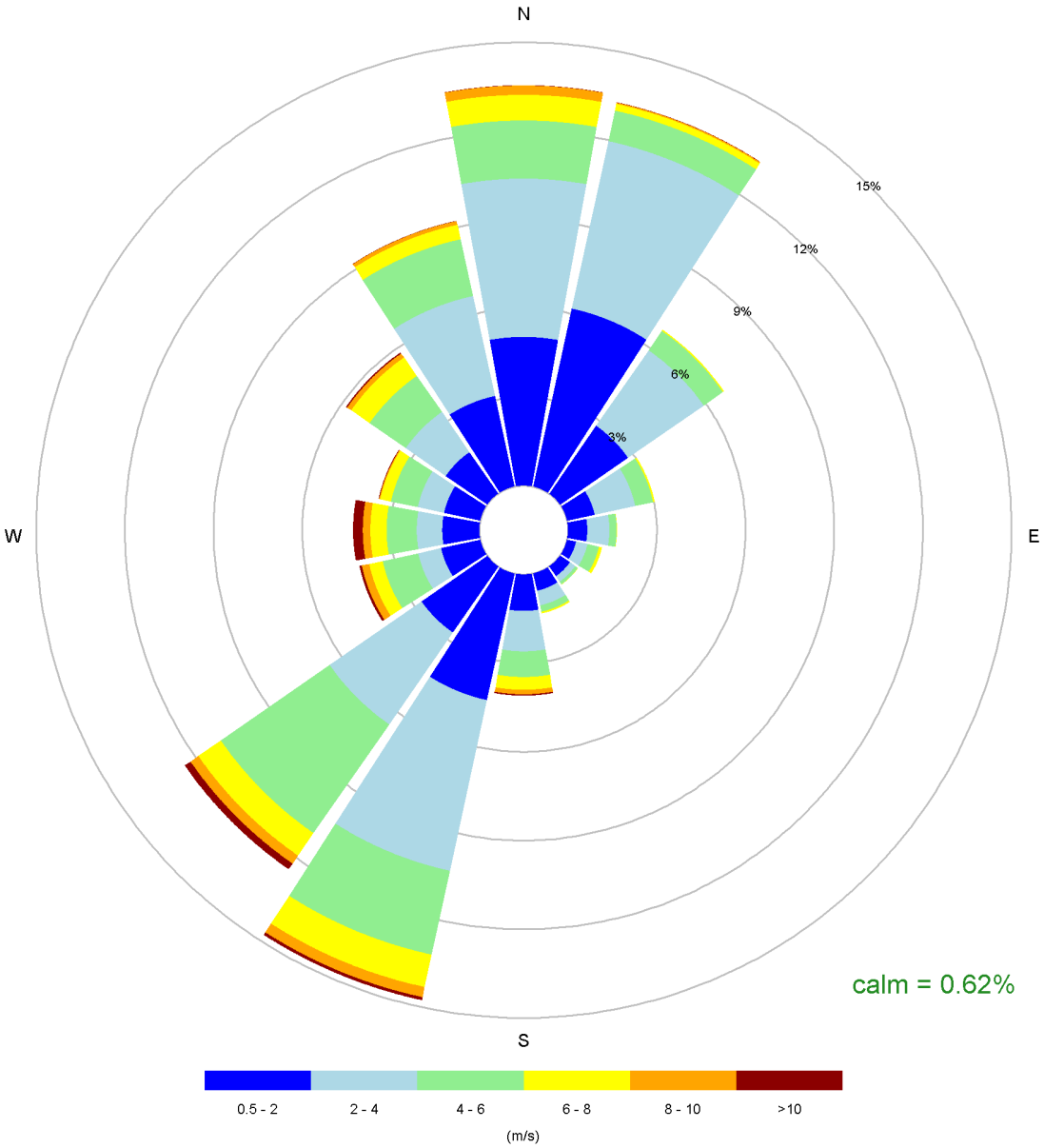
Figure 6. Calico-Vale Meteorological Tower Location



[5] EM Strategies. 2018. Grassy Mountain Mine Project Air Quality Resources Baseline Report. January, 2018.

[6] EPA. 2000. Meteorological Monitoring Guidance for Regulatory Modeling Applications. EPA-454/R-9905. February, 2000.

Figure 7. Wind rose for the Calico-Vale Meteorological Station



2.9 Background Concentrations

A background concentration will be added to the modeled PM_{10} concentrations to account for the prevailing air pollution in the modeling domain before comparison with standard for the NAAQS compliance demonstration. The Baseline Study included monitoring PM_{10} and determining a background concentration as the second highest concentration Oct. 2014 – Sept. 2015 period, excluding periods affected by wildfires[7]. The background concentration to be used is presented in Table 2.

Table 2. Background Concentration

Pollutant	Averaging Period	Form	Background Concentration ($\mu g/m^3$)
PM_{10}	24-Hour	2nd High	23.0

[7] EM Strategies. 2018. Grassy Mountain Mine Project Air Quality Resources Baseline Report. January, 2018.

3.0 RISK ASSESSMENT WORK PLAN

3.1 Level 3 Risk Assessment

As part of the application for the Standard ACDP, a CAO Level 3 Risk Assessment will be performed for the facility. The Risk Assessment will use many of the same modeling procedures described in the Modeling Protocol, including source characterization, meteorology, and receptor grids. For the Level 3 Risk Assessment, this Risk Assessment Work Plan provides additional information regarding a conceptual site model for exposure, the exposure assessment and risk characterization, and an uncertainty evaluation.

3.2 Conceptual Site Model

3.2.1 Toxic Emissions

For the risk assessment, toxic emissions impacting the inhalation pathway are expected to occur from the following facility activities described in Section 1.1:

- Propane combustion, including combustion at the carbon regeneration kiln and assuming all building heaters are propane fired
- Toxic pollutants found in the dust emitted from site activities, including ore and waste rock crushing, rock drilling, rock blasting, material transfers, and wind erosion
- Mercury emissions from the following process sources: kiln, electrowinning circuit, mercury retort, and melting furnace
- Hydrogen cyanide emissions from CIL tanks, cyanide detoxification tanks, and the tailings management facility
- Cement Silo Filling and Cement Truck Loading

Tailpipe emissions from nonroad equipment operating underground will also be considered. These emissions are from mobile sources and are exempt from consideration under the CAO program, but are being considered at the request of ODEQ (see Section 2.3.2).

A summary of facility-wide potential emissions of TACs is provided in Table 3. Potential emissions of TACs by individual TEU are provided in Appendix C. Detailed emissions calculations for are provided as Form AQ520 and in the emissions inventory (Appendix E). The conceptual site model for the CAO is summarized in Figure 8.

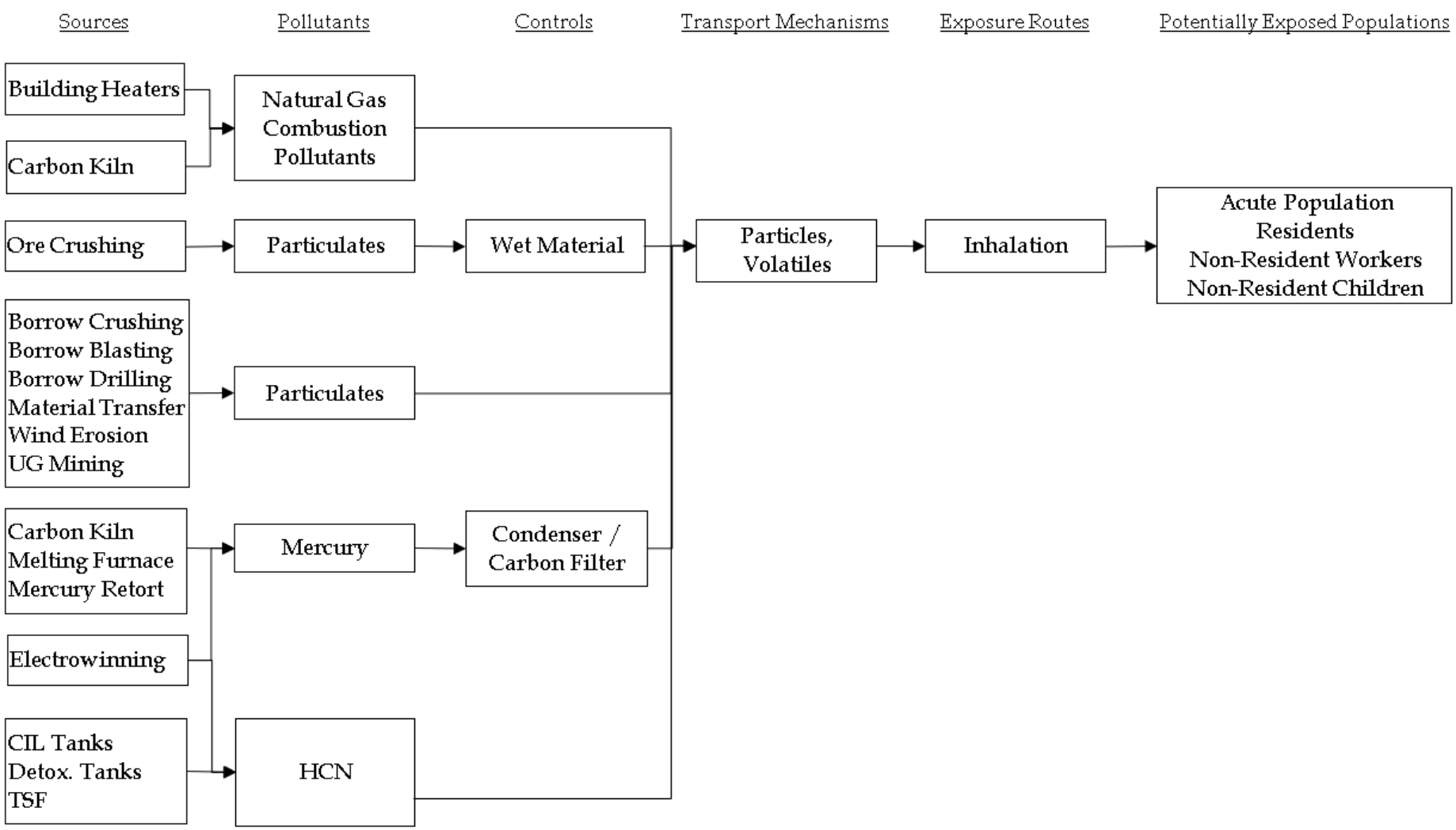
Table 3. Facility-Wide Potential Emissions of TACs and Risk-Based Concentrations (RBC)

CAS or DEQ ID	TAC	Residential Chronic		Non-Residential Chronic				Acute	Facility Total	
		Cancer RBC (µg/m³)	Non-cancer RBC (µg/m³)	Child Cancer RBC (µg/m³)	Child Non-cancer RBC (µg/m³)	Worker Cancer RBC (µg/m³)	Worker Non-cancer RBC (µg/m³)	Non-cancer RBC (µg/m³)	(ton/year)	(pound/day)
7440-36-0	Antimony and compounds		3.0E-1		1.3E+0		1.3E+0	1.0E+0	5.5E-4	4.8E-3
7440-38-2	Arsenic and compounds	2.4E-5	1.7E-4	1.3E-3	2.4E-3	6.2E-4	2.4E-3	2.0E-1	1.8E-3	2.2E-2
7440-41-7	Beryllium and compounds	4.2E-4	7.0E-3	1.1E-2	3.1E-2	5.0E-3	3.1E-2	2.0E-2	2.2E-5	1.9E-4
7440-43-9	Cadmium and compounds	5.6E-4	5.0E-3	1.4E-2	3.7E-2	6.7E-3	3.7E-2	3.0E-2	1.7E-4	6.9E-3
18540-29-9	Chromium VI, chromate, and dichromate particulate	3.1E-5	8.3E-2	5.2E-4	8.8E-1	1.0E-3	8.8E-1	3.0E-1	3.3E-4	3.2E-3
7440-48-4	Cobalt and compounds		1.0E-1		4.4E-1		4.4E-1		3.2E-5	2.7E-4
7439-92-1	Lead and compounds		1.5E-1		6.6E-1		6.6E-1	1.5E-1	8.6E-4	3.8E-2
7439-96-5	Manganese and compounds		9.0E-2		4.0E-1		4.0E-1	3.0E-1	1.4E-3	2.4E-2
7439-97-6	Mercury and compounds		7.7E-2		6.3E-1		6.3E-1	6.0E-1	4.4E-3	9.8E-2
C365	Nickel compounds, insoluble	3.8E-3	1.4E-2	1.0E-1	6.2E-2	4.6E-2	6.2E-2	2.0E-1	4.8E-4	1.8E-2
7440-39-3	Barium and compounds								8.5E-3	7.4E-2
7440-50-8	Copper and compounds							1.0E+2	5.3E-4	2.0E-2
7440-62-2	Vanadium (fume or dust)		1.0E-1		4.4E-1		4.4E-1	8.0E-1	3.0E-4	2.4E-3
7440-66-6	Zinc and compounds								3.1E-3	1.1E-1
1313-27-5	Molybdenum trioxide								8.1E-5	7.2E-4
7440-22-4	Silver and compounds								3.5E-5	3.4E-4
7631-86-9	Silica, crystalline (respirable)		3.0E+0		1.3E+1		1.3E+1		3.2E+0	3.1E+1
115-07-1	Propylene		3.0E+3		1.3E+4		1.3E+4		5.7E-2	2.2E+0
106-99-0	1,3-Butadiene	3.3E-2	2.0E+0	8.6E-1	8.8E+0	4.0E-1	8.8E+0	6.6E+2	2.0E-2	9.6E-1
75-05-8	Acetonitrile		6.0E+1		2.6E+2		2.6E+2		6.0E-3	5.6E-2
107-02-8	Acrolein		3.5E-1		1.5E+0		1.5E+0	6.9E+0	4.4E-3	1.7E-1
67-64-1	Acetone		3.1E+4		1.4E+5		1.4E+5	6.2E+4	4.1E-4	3.8E-3
67-63-0	Isopropyl alcohol		2.0E+2		8.8E+2		8.8E+2	3.2E+3	7.8E-4	7.3E-3
107-13-1	Acrylonitrile	1.5E-2	5.0E+0	3.8E-1	2.2E+1	1.8E-1	2.2E+1	2.2E+2	1.1E-3	1.1E-2
71-43-2	Benzene	1.3E-1	3.0E+0	3.3E+0	1.3E+1	1.5E+0	1.3E+1	2.9E+1	4.1E-2	9.8E-1
108-88-3	Toluene		5.0E+3		2.2E+4		2.2E+4	7.5E+3	7.8E-2	8.5E-1
100-41-4	Ethyl benzene	4.0E-1	2.6E+2	1.0E+1	1.1E+3	4.8E+0	1.1E+3	2.2E+4	1.6E-2	1.3E-1
100-42-5	Styrene		1.0E+3		4.4E+3		4.4E+3	2.1E+4	5.4E-4	5.1E-3

108-67-8	1,3,5-Trimethylbenzene		6.0E+1		2.6E+2		2.6E+2		1.7E-4	1.6E-3
91-20-3	Naphthalene	2.9E-2	3.7E+0	7.6E-1	1.6E+1	3.5E-1	1.6E+1	2.0E+2	7.1E-3	1.2E-1
7782-49-2	Selenium and compounds							2.0E+0	2.1E-4	9.9E-3
91-57-6	2-Methyl naphthalene								9.6E-7	8.6E-6
56-49-5	3-Methylcholanthrene								5.4E-8	3.0E-7
57-97-6	7,12-Dimethylbenz[a]anthracene								4.8E-7	2.6E-6
83-32-9	Acenaphthene								3.0E-4	1.5E-2
208-96-8	Acenaphthylene								3.6E-4	1.8E-2
75-07-0	Acetaldehyde	4.5E-1	1.4E+2	1.2E+1	6.2E+2	5.5E+0	6.2E+2	4.7E+2	7.1E-2	3.5E+0
7664-41-7	Ammonia		5.0E+2		2.2E+3		2.2E+3	1.2E+3	8.1E-1	1.6E+1
120-12-7	Anthracene								3.6E-4	1.8E-2
56-55-3	Benz[a]anthracene	2.1E-4		7.8E-3		1.5E-2			3.5E-4	1.7E-2
50-32-8	Benzo[a]pyrene	4.3E-5	2.0E-3	1.6E-3	8.8E-3	3.0E-3	8.8E-3	2.0E-3	3.2E-6	1.6E-4
205-99-2	Benzo[b]fluoranthene	5.3E-5		2.0E-3		3.8E-3			6.0E-4	3.0E-2
191-24-2	Benzo[g,h,i]perylene	4.7E-3		1.7E-1		3.4E-1			3.1E-7	1.3E-5
207-08-9	Benzo[k]fluoranthene	1.4E-3		5.2E-2		1.0E-1			6.0E-4	3.0E-2
218-01-9	Chrysene	4.3E-4		1.6E-2		3.0E-2			3.2E-4	1.6E-2
53-70-3	Dibenz[a,h]anthracene	4.3E-6		1.6E-4		3.0E-4			3.1E-4	1.5E-2
206-44-0	Fluoranthene	5.3E-4		2.0E-2		3.8E-2			3.6E-4	1.8E-2
86-73-7	Fluorene								1.9E-3	9.3E-2
50-00-0	Formaldehyde	1.7E-1	9.0E+0	4.3E+0	4.0E+1	2.0E+0	4.0E+1	4.9E+1	1.6E-1	7.6E+0
110-54-3	Hexane		7.0E+2		3.1E+3		3.1E+3		1.2E-1	7.8E-1
193-39-5	Indeno[1,2,3-cd]pyrene	6.1E-4		2.2E-2		4.3E-2			3.1E-4	1.5E-2
106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)	9.1E-2	6.0E+1	2.4E+0	2.6E+2	1.1E+0	2.6E+2	1.2E+4	3.6E-5	2.0E-4
85-01-8	Phenanthrene								3.5E-3	1.7E-1
129-00-0	Pyrene								7.6E-4	3.7E-2
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		2.2E+2		9.7E+2		9.7E+2	8.7E+3	1.1E-1	2.2E+0
74-90-8	Cyanide, Hydrogen		8.0E-1		3.5E+0		3.5E+0	3.4E+2	1.9E+0	1.2E+1
12185-10-3	Phosphorus, white		9.0E+0		4.0E+1		4.0E+1	2.0E+1	2.8E-5	2.5E-4
108-90-7	Chlorobenzene		5.0E+1		2.2E+2		2.2E+2		1.8E-5	8.9E-4
7647-01-0	Hydrochloric Acid		2.0E+1		8.8E+1		8.8E+1	2.1E+3	1.7E-2	8.3E-1
C200	Diesel Particulate Matter	1.0E-1	5.0E+0	2.6E+0	2.2E+1	1.2E+0	2.2E+1		3.7E+0	2.9E+2
192-97-2	Benzo[e]pyrene								2.4E-8	4.6E-7
198-55-0	Perylene								4.6E-8	8.9E-7

92-52-4	Biphenyl					9.7E-5	5.3E-4
110-82-7	Cyclohexane	6.0E+3	2.6E+4	2.6E+4		2.2E-3	1.2E-2
108-95-2	Phenol	2.0E+2	8.8E+2	8.8E+2	5.8E+3	5.1E-4	2.8E-3
95-63-6	1,2,4-Trimethylbenzene	6.0E+1	2.6E+2	2.6E+2		2.3E-2	1.3E-1
98-82-8	Isopropylbenzene (Cumene)	4.0E+2	1.8E+3	1.8E+3		4.6E-3	2.5E-2

Figure 8. CAO Conceptual Site Model Diagram



3.2.2 Exposure Locations

For the risk assessment, the gridded receptors presented in Section 2.7 were compared with land use data to determine which receptors represent the following types of locations (and potentially exposed population types):

- Acute open space (acute population)
- Residential (residents)
- Commercial (non-resident workers)
- Schools (non-resident children)

The classification of the receptors within the gridded receptor networks in shown in Figure 7.

In addition, receptors were modeled to represent specific population locations, including the closest campgrounds, residences, businesses, and schools. A list of all non-acute classified receptors is provided in Appendix D; the non-acute receptors nearest the facility are listed in Table 4. The locations and classifications of all receptors are shown in Figure 9 and Figure 10 and provided as a digital attachment to this document in Appendix B.

Table 4. Nearest Exposure Locations by Risk Class

Easting	Northing	Risk Classification	OR Zoning Code	Zoning Description
466000.0	4886000.0	Residential	RNG	Federal Range
468000.0	4886000.0	Residential	EFU80	Exclusive Farm Use 80
504000.0	4874000.0	Residential	MHDR	Medium High Density Residential
467702.0	4839557.0	Worker	RNG	Federal Range
474243.0	4839495.0	Worker	RNG	Federal Range
466286.6	4829470.7	Worker	RNG	Federal Range
451130.0	4857129.0	Child	RC	Residential-Commercial
480485.0	4869487.0	Child	MDR	Medium Density Residential
494402.0	4843162.0	Child	No zoning class	

The acute exposure hazard will be calculated for all receptors in Oregon. Additionally, chronic cancer and chronic non-cancer risks will be calculated for those receptors representing residents, non-resident workers, and non-resident children. A description of the risk calculation is provided in Section 3.3.

Figure 9. Gridded Exposure Locations and Zoning

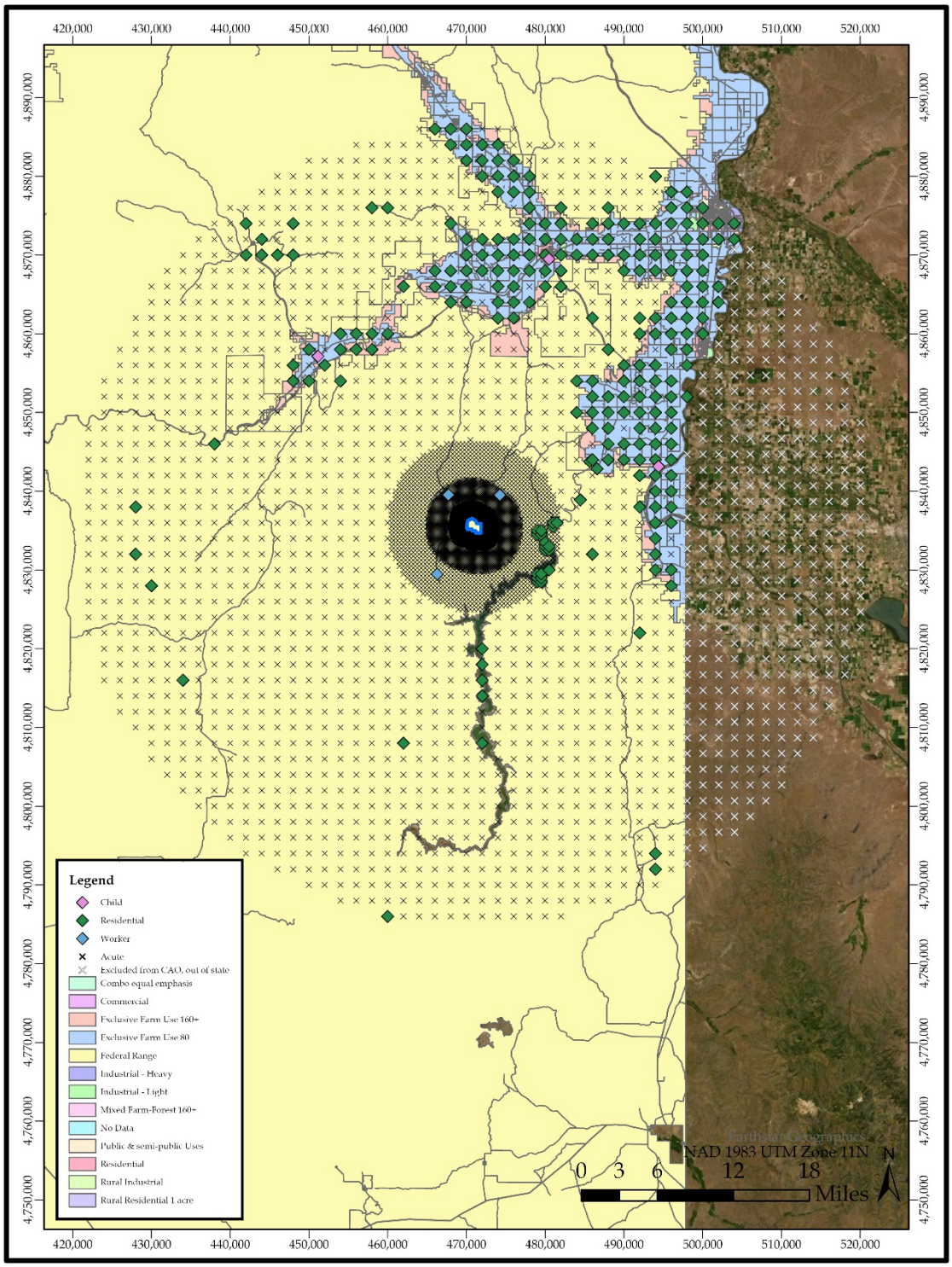
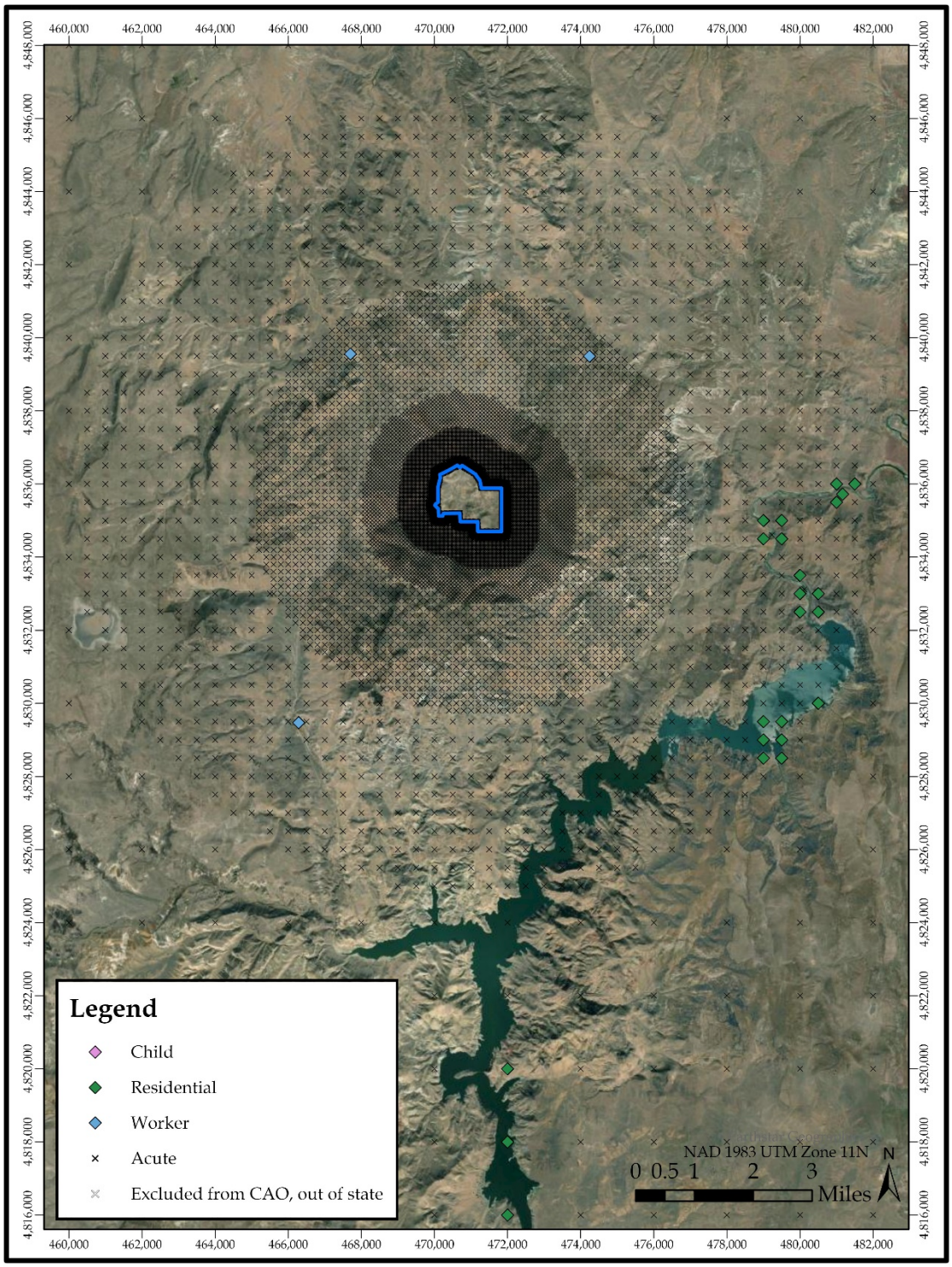


Figure 10. Exposure Locations Near the Proposed Facility Boundary



3.3 Exposure Assessment and Risk Characterization

Risk will be estimated using AERMOD modeling and Method C Risk Equivalent Emission Rate (REER)[8]. The maximum total modeled risk impacts will be based on the Risk-Based Concentrations (RBCs) provided in Table 3 to estimate the potential risks at the exposure locations identified in Section 3.2.2 for each exposure scenario.

AERMOD modeling for the Level 3 risk assessment will use the source characterizations, building downwash parameters, and meteorological data as described Section 2.0.

For the CAO risk assessment modeling, each model source, as listed in Appendix A, will be modeled with a REER. The REER for each source will be calculated by taking the sum of the sources' ratios of the TACs' emission rates to the TACs' respective RBCs. The resultant AERMOD output for an exposure scenario will therefore represent a total risk at each receptor, rather than a concentration of any individual TAC.

Some TEUs in AQ520.2 represent multiple AERMOD sources, and some AERMOD sources represent multiple TEUs. For those TEUs which represent multiple sources, the REER will be allocated to the associated sources for modeling. For sources which represent multiple TEUs, the total REER for the associated TEUs will be modeled. A list of the proposed TEUs, model sources, and allocation percentages is provided in .

For example, CAO TACs emissions are calculated for Ore Crushing circuit source group (OC), based on the estimated total particulate matter (PM) emitted. Modeled sources for the OC group include sources OC1 through OC13, which represent individual material transfers and crusher emissions, and the PM emissions from each source are calculated in the emissions inventory. In the CAO model, the OC REER will be allocated to the thirteen specific sources based on the portion of PM emitted by each source. In , OC8 is shown to have an allocation of 20.0%, which is the percentage of the OC group PM emissions emitted from OC8. In the CAO risk calculation, OC8 will be assigned 20.0% of the OC TEU's REER.

Another example is the mine vent model source (UG). Emissions from the Underground Fugitive Dust (UFD), Underground Diesel usage (UDP), Underground Blasting emulsion volatile organic compounds (UB), and Underground Blasting emulsion metals (UBD) TEUs will be emitted from the UG source, so the REER for those four TEUs will be allocated to the UG source.

[8] DEQ. 2020. Recommended Procedures for Air Quality Dispersion Modeling. April 2020. Appendix A, Method C.

Table 5. TEU Modeling Sources and Allocation

TEU	SOURCE	Allocation
OC	OC1	2.3%
	OC2	2.3%
	OC3	20.0%
	OC4	2.3%
	OC5	36.7%
	OC6	2.3%
	OC7	2.3%
	OC8	20.0%
	OC9	2.3%
	OC10	2.3%
	OC11	2.3%
	OC12	2.3%
	OC13	2.3%
BC	BC1	5.3%
	BC2	5.3%
	BC3	9.5%
	BC4	5.3%
	BC5	5.3%
	BC6	5.3%
	BC7	44.0%
	BC8	9.5%
	BC9	5.3%
	BC10	5.3%
AFD	BRW	46.9%
	BRWBLAST	30.5%
	WRSF	7.1%
	CRF	7.5%
	STK	6.9%
	TS1	0.8%
	TS2	0.3%
BRWB	BRWBLAST	100%
BRWBD		100%
CKD	CKD	100%
CKDHG		100%
MFP	MF	100%
MFHG		100%
MFD		100%
UFD	UG	100%
UDP		100%
UB		100%
UBD		100%
MR	MR	100%
HA	HA	100%
HPO	HPO	100%

TEU	SOURCE	Allocation
HL	HL	100%
HWW	HWW	100%
HTW	HTW	100%
HMO	HMO	100%
EW	EW	100%
TSF	TSF	100%
POND	POND	100%
LEACH1	LEACH1	100%
LEACH2	LEACH2	100%
CILTANK1	CILTANK1	100%
CILTANK2	CILTANK2	100%
CILTANK3	CILTANK3	100%
CILTANK4	CILTANK4	100%
CILTANK5	CILTANK5	100%
CILTANK6	CILTANK6	100%
CILTANK7	CILTANK7	100%
CEM1	CEM1	100%
CEM2	CEM2	100%
CEM3	CEM3	100%
CEM4	CEM4	100%
CEM5	CEM5	100%
EDG1	EDG1	100%
EDFP	EDFP	100%
LS1	LS1	100%
LS2	LS2	100%
TG1	TG1	100%
TD1	TD1	100%
TD2	TD2	100%

REERs will be calculated, and total risk modeled, for each exposure scenario using the appropriate RBCs. Maximum risk for each scenario will be output to AERMOD plot files for daily or annual averaging periods. A daily plot file will be used for the acute exposure analysis, and annual plot files used for the chronic cancer and chronic non-cancer exposure analyses.

Each receptor has three risk values: chronic cancer risk, chronic non-cancer risk, and acute risk. For informational purposes, the chronic risk values are grouped by exposure location type (residents, non-resident workers, and non-resident children). This results in seven risk levels being determined, so seven exposure scenarios will be modeled.

The risk values are compared to the appropriate new facility Risk Action Levels (RALs), shown in Table 6.

Table 6. Risk Action Levels

Risk Action Level	Cancer	Non-Cancer
Source Permit Level	0.5	0.5
Community Engagement Level	5	1
TBACT Level	10	1
Permit Denial Level	25	1

3.4 Uncertainty Evaluation

A qualitative evaluation of uncertainty in the risk estimates will be included as part of the Level 3 risk assessment. While all guidance and best practices will be followed, several factors contribute to uncertainty in the final risk estimates. Those factors include the following:

- If Risk-Based Concentrations (RBCs) are developed using Toxicity Reference Values (TRVs) derived from exposures of less than 24 hours (e.g., eight hours or one hour), using a 24-hour averaging period may underestimate risk.
- Uncertainty in the RBCs leads to corresponding uncertainty in the estimation of risk from those TACs.
- For the assessment, 16 TACs identified by Oregon DEQ, included in the emissions inventory, and listed in Table 5-1 have no RBC, and therefore any potential risk associated with exposure to them was not quantified.
- Pollutant emissions have been estimated with widely used, generally accepted emission factors that are appropriate for each emission source. However, in some cases, the best (or only) available emission factor is rated "C" (average), "D" (below average) or "E" (poor). These low emission factor quality ratings lead to higher uncertainty in the emission estimates as well as the risk estimates based on those emissions. In particular, the calculations of PM emissions (a primary source of TACs) use conservatively high emission factors. This leads to a correspondingly high over-estimation of risk in the assessment.
- Acute risk estimates are based on 24-hour emission rates. The 24-hour process emission rates are calculated from maximum hourly activity occurring all hours of day. This continuous level of activity is unlikely to occur for all emission sources at the same time. For example, during blasting a large area of the facility must be cleared, and all other activity in the vicinity stops. A day on which multiple blast events occur would likely have reduced emissions from other mining activity. However, calculated maximum emission rates do not take this into account, which leads to an overestimation of risk in the assessment.
- The acute risk estimate is based on a 24-hour exposure period at a single location. For many of the locations assessed for acute exposure and near to the facility, a continuous 24-hour exposure is unlikely due to the remote nature of the facility.

- The risk assessment is based on AERMOD modeling. The AERMOD modeling system has been demonstrated to generally over-predict the highest modeled impacts, which leads to a corresponding overestimation of risk.[9]

[9] See, e.g., EPA. 2018. Environmental Protection Agency, "AERMOD Model Formulation and Evaluation." EPA-454/R-18-2003. April, 2018.

Appendix A – Model Source Parameters

Table A-1. AERMOD POINT Source Parameters

Model ID	Description	UTM E. (m)	UTM N. (m)	Elev. (m)	Rel. Ht. (m)	T (K)	Vel. (m/s)	Dia. (m)
LS1	Lime Silo Loading	471029.00	4835733.09	1132.86	3.72	0.00	30.48	0.15
CKD	Carbon Regeneration Kiln (Drum)	471058.00	4835716.22	1132.86	6.10	338.7	3.09	0.15
CKB	Carbon Regeneration Kiln (Burners)	471060.00	4835716.15	1132.86	6.10	455.4	0.00	0.15
EW	Electrowinning Cells & Pregnant Solution Tank	471061.00	4835708.50	1132.71	6.10	310.9	49.19	0.20
MR	Mercury Retort	471067.00	4835705.70	1132.71	6.10	338.7	1.54	0.09
MF	Melting Furnace	471070.00	4835705.25	1132.71	6.10	338.7	30.40	0.30
LABSP	Sample Preparation	471102.79	4835694.81	1129.42	2.32	0.00	4.15	0.76
LABFA	Fire Assay	471102.79	4835694.81	1129.42	2.32	0.00	4.15	0.76
EDG1	Emergency Generator (Mfr. Yr. >2007; diesel)	471067.88	4835743.52	1132.15	3.05	727.59	28.82	0.20
EDFP	Emergency Diesel Fire Pump	471073.88	4835743.52	1132.21	4.57	866.48	30.05	0.20
HA	Administration HVAC	471107.49	4835718.64	1129.42	2.32	455.4	0.17	1.13
HPO	Plant Office and Dry HVAC	471112.49	4835718.64	1129.42	2.32	455.4	0.17	1.13
HL	Laboratory HVAC	471104.79	4835694.81	1129.42	2.32	455.4	0.17	1.13
HWW	Plant Workshop and Warehouse HVAC	471126.42	4835693.95	1129.42	2.32	455.4	0.17	1.13
HTW	Truck Workshop and Warehouse HVAC	471085.16	4835636.39	1138.32	4.74	455.4	0.34	1.13
HMO	Mine Office and Changehouse HVAC	471117.49	4835718.64	1129.42	2.32	455.4	0.17	1.13
CEM1	Cement/Shotcrete loading to silo	470914.33	4835478.67	1141.73	4.09	0.00	30.48	0.15
UG	Underground	471034.00	4835236.00	1209.00	3.00	298.2	20.98	3.66

Table A-2. AERMOD VOLUME Source Parameters

Model ID	Description	UTM E. (m)	UTM N. (m)	Elev. (m)	Rel. Ht. (m)	$\sigma_{y,0}$ (m)	$\sigma_{z,0}$ (m)
OC1	Dump of Ore to ROM Hopper	470989.00	4835653.60	1137.03	6.11	0.40	2.51
OC2	Hopper to Vibrating Pan Feeder	470989.00	4835655.60	1137.03	3.75	0.13	0.28
OC3	Primary Crusher (including transfers in and out)	470989.00	4835657.60	1137.03	2.67	0.17	0.50
OC4	Primary Crusher Discharge Conveyor Transfer to Screen Feed Conveyor	470989.00	4835659.60	1137.03	2.62	0.17	0.23
OC5	Ore Screen (including transfers in and out)	470986.00	4835673.00	1137.03	3.15	0.21	0.92
OC6	Transfer to Secondary Crusher Surge Bin	470983.00	4835657.60	1137.03	0.91	0.11	0.28
OC7	Secondary Crusher Surge Bin to Secondary Crusher Vibrating Feeder	470983.00	4835658.60	1137.03	3.78	0.11	0.23
OC8	Secondary Crusher (including transfers in and out)	470986.00	4835682.06	1137.03	3.67	0.14	0.44
OC9	Secondary Crusher Discharge Conveyor Transfer to Screen Feed Conveyor	470989.00	4835660.10	1137.03	2.07	0.17	0.37
OC10	Screen Discharge Conveyor Transfer to Product Conveyor	470991.00	4835660.10	1137.03	7.50	0.17	1.25
OC11	Product Conveyor Transfer to Fine Ore Bin	471057.00	4835682.06	1137.03	5.12	0.57	1.62
OC12	Fine Ore Bin Discharge Feeder to Ball Mill Feed Conveyor	471057.00	4835684.06	1137.03	2.76	0.14	1.03
OC13	Ball Mill Feed Conveyor to Ball Mill Transfer	471057.00	4835724.00	1133.00	6.87	0.24	1.09
BC1	Dump of Borrow to Surge Bin	471677.83	4835421.21	1162.61	6.11	0.40	2.51
BC2	Surge Bin to Vibrating Grizzly Transfer	471677.83	4835425.21	1161.78	3.75	0.13	0.28
BC3	Primary Crusher (including transfers in and out)	471677.83	4835427.60	1161.28	2.67	0.17	0.50
BC4	Crusher Discharge Conveyor Transfer Point	471677.83	4835430.12	1160.76	2.62	0.17	0.23
BC5	Screen Feed Conveyor 1 Transfer Point	471677.83	4835430.12	1160.76	0.91	0.11	0.28
BC6	Screen Feed Conveyor 2 Transfer Point	471677.83	4835430.12	1160.76	3.78	0.11	0.23
BC7	Screen (including transfers in and out)	471677.83	4835430.12	1160.76	3.15	0.21	0.92
BC8	Cone Crusher (including transfers in and out)	471677.83	4835427.60	1161.28	3.67	0.14	0.44
BC9	Screen Discharge Conveyor Transfer to Stockpile Conveyor	471667.63	4835430.12	1160.04	2.07	0.17	0.37
BC10	Ore Stockpile Conveyor Transfer to Borrow Stockpile	471680.12	4835465.77	1160.95	7.50	0.17	1.25
LS2	Lime Silo Unloading to Lime Slaker	471023.00	4835717.69	1132.86	1.14	0.17	1.06
CEM2	Cement/Shotcrete unloading to batch plant	470918.73	4835517.90	1141.73	1.14	0.17	1.06
CEM3	Aggregate transfer	470918.73	4835517.90	1141.73	1.86	0.59	1.73
CEM4	Weigh hopper loading	470918.73	4835517.90	1141.73	1.86	0.59	1.73
CEM5	Mixer loading (central mix)	470918.73	4835517.90	1141.73	1.86	0.59	1.73
TG1	Mine Site Gasoline Tank #1	471041.97	4835607.09	1138.32	1.45	0.67	1.35
TD1	Mine Site Diesel Tank #1	471041.97	4835607.09	1138.32	2.74	1.28	2.55
TD2	Mine Site Diesel Tank #2	471041.97	4835607.09	1138.32	1.07	0.50	0.99

Model ID	Description	UTM E. (m)	UTM N. (m)	Elev. (m)	Rel. Ht. (m)	$\sigma_{y,0}$ (m)	$\sigma_{z,0}$ (m)
BRWBLAST	Borrow Blasting	471724.00	4835149.00	1185.27	75.00	20.93	34.88
WRSF	WRSF	470616.00	4835523.00	1113.73	2.25	27.47	2.10
CRF	CRF Stockpile	470903.00	4835531.00	1140.34	2.25	4.91	2.10
STK	Ore Stockpile	470988.00	4835617.50	1137.03	2.25	7.76	2.10

Table A-3. AERMOD AREA Source Parameters

Model ID	Description	UTM E. (m)	UTM N. (m)	Elev. (m)	Rel. Ht. (m)	X_0 (m)	Y_0 (m)	Angle (deg)	$\sigma_{z,0}$ (m)
BRW	Borrow Pit	471619.80	4834732.10	1185.27	2.25	208.30	833.30	-	2.10
TS1	Topsoil Storage 1	470380.33	4836335.90	1108.38	-	150.20	300.50	58.40	-
TS2	Topsoil Storage 2	470138.30	4835246.80	1083.58	-	144.10	144.10	-	-
TSF	Tailings Storage Facility	470108.95	4835830.68	1103.38	-	418.46	836.93	59.53	-
POND	Tailings Pipeline Reclaim Pond	470719.50	4836288.40	1076.06	-	38.60	38.60	-	-
LEACH1	CN Leach Tank 1	471022.12	4835705.18	1133.79	7.80	5.76	5.76	-	-
LEACH2	CN Leach Tank 2	471030.12	4835705.18	1133.79	7.80	5.76	5.76	-	-
CILTANK1	CIL Tank 1	471037.12	4835705.18	1133.79	7.80	5.76	5.76	-	-
CILTANK2	CIL Tank 2	471045.12	4835705.18	1133.79	7.80	5.76	5.76	-	-
CILTANK3	CIL Tank 3	471049.12	4835698.20	1133.79	7.80	5.76	5.76	-	-
CILTANK4	CIL Tank 4	471041.12	4835698.20	1133.79	7.80	5.76	5.76	-	-
CILTANK5	CIL Tank 5	471033.12	4835698.21	1133.79	7.80	5.76	5.76	-	-
CILTANK6	CIL Tank 6	471026.12	4835698.20	1133.79	7.80	5.76	5.76	-	-
CILTANK7	CIL Tank 7	471018.12	4835698.21	1133.79	7.80	5.76	5.76	-	-

Table A-4. AERMOD LINE Source Locations

Route	Model ID	X1	Y1	X2	Y2	Elev. (m)
Portal Cut to WRSF	HR_POR_WRF1	470,899.15	4,835,456.84	470,882.68	4,835,484.36	1,145.72
	HR_POR_WRF2	470,882.68	4,835,484.36	470,868.72	4,835,507.67	1,139.93
	HR_POR_WRF3	470,868.72	4,835,507.67	470,793.34	4,835,633.62	1,127.30
	HR_POR_WRF4	470,793.34	4,835,633.62	470,732.85	4,835,631.70	1,114.15
	HR_POR_WRF5	470,732.85	4,835,631.70	470,677.88	4,835,563.65	1,110.32
Portal Cut to Ore Stockpile	HR_POR_ORE1	470,899.15	4,835,456.84	470,882.68	4,835,484.36	1,145.72
	HR_POR_ORE2	470,882.68	4,835,484.36	470,868.72	4,835,507.67	1,139.93
	HR_POR_ORE3	470,868.72	4,835,507.67	470,939.99	4,835,614.43	1,137.82
South Entrance Borrow to WRSF	HR_BWS_WRF1	471,613.97	4,834,902.04	471,584.03	4,834,992.14	1,172.41
	HR_BWS_WRF2	471,584.03	4,834,992.14	471,562.21	4,835,182.20	1,158.90
	HR_BWS_WRF3	471,562.21	4,835,182.20	471,550.93	4,835,351.66	1,149.58
	HR_BWS_WRF4	471,550.93	4,835,351.66	471,451.28	4,835,552.61	1,140.36
	HR_BWS_WRF5	471,451.28	4,835,552.61	471,233.88	4,835,601.96	1,133.31
	HR_BWS_WRF6	471,233.88	4,835,601.96	470,898.18	4,835,551.79	1,135.69
	HR_BWS_WRF7	470,898.18	4,835,551.79	470,868.72	4,835,507.67	1,137.56
	HR_BWS_WRF8	470,868.72	4,835,507.67	470,793.34	4,835,633.62	1,127.30
	HR_BWS_WRF9	470,793.34	4,835,633.62	470,732.85	4,835,631.70	1,114.15
	HR_BWS_WRF10	470,732.85	4,835,631.70	470,677.88	4,835,563.65	1,110.32
North Entrance Borrow to WRSF	HR_BWN_WRF1	471,677.83	4,835,421.21	471,630.99	4,835,410.94	1,160.96
	HR_BWN_WRF2	471,630.99	4,835,410.94	471,562.21	4,835,182.20	1,155.40
	HR_BWN_WRF3	471,562.21	4,835,182.20	471,550.93	4,835,351.66	1,149.58
	HR_BWN_WRF4	471,550.93	4,835,351.66	471,451.28	4,835,552.61	1,140.36
	HR_BWN_WRF5	471,451.28	4,835,552.61	471,233.88	4,835,601.96	1,133.31
	HR_BWN_WRF6	471,233.88	4,835,601.96	470,898.18	4,835,551.79	1,135.69
	HR_BWN_WRF7	470,898.18	4,835,551.79	470,868.72	4,835,507.67	1,137.56
	HR_BWN_WRF8	470,868.72	4,835,507.67	470,793.34	4,835,633.62	1,127.30
	HR_BWN_WRF9	470,793.34	4,835,633.62	470,732.85	4,835,631.70	1,114.15
	HR_BWN_WRF10	470,732.85	4,835,631.70	470,677.88	4,835,563.65	1,110.32
WRSF to Portal Cut	HR_WRF_POR1	470,677.88	4,835,563.65	470,732.85	4,835,631.70	1,110.32
	HR_WRF_POR2	470,732.85	4,835,631.70	470,793.34	4,835,633.62	1,114.15
	HR_WRF_POR3	470,793.34	4,835,633.62	470,868.72	4,835,507.67	1,127.30
	HR_WRF_POR4	470,868.72	4,835,507.67	470,882.68	4,835,484.36	1,139.93
	HR_WRF_POR5	470,882.68	4,835,484.36	470,899.15	4,835,456.84	1,145.72
WRSF to CRF Stockpile	HR_WRF_CRF1	470,677.88	4,835,563.65	470,732.85	4,835,631.70	1,110.32
	HR_WRF_CRF2	470,732.85	4,835,631.70	470,793.34	4,835,633.62	1,114.15
	HR_WRF_CRF3	470,793.34	4,835,633.62	470,868.72	4,835,507.67	1,127.30
	HR_WRF_CRF4	470,868.72	4,835,507.67	470,882.68	4,835,484.36	1,139.93
	HR_WRF_CRF5	470,882.68	4,835,484.36	470,894.69	4,835,516.89	1,141.56
CRF Stockpile to Portal Cut	HR_CRF_POR1	470,894.69	4,835,516.89	470,882.68	4,835,484.36	1,141.56
	HR_CRF_POR2	470,882.68	4,835,484.36	470,899.15	4,835,456.84	1,145.72

Table A-5. AERMOD LINE Source Parameters[a]

Model ID	Rel. Ht. (m)	Width (m)	$\sigma_{z,0}$ (m)
HR_*	2.27	9.88	2.11

[a] All haul road LINE sources are characterized with identical release heights, widths, and initial vertical dispersion based on the mobile machinery parameters.

Appendix B - BPIPPRM Building Parameters

Buildings dimensions were based on the planned facility layout. The formatted BPIP-Prime text file that includes building information is included in the digital attachment link below.

The attachment contains all files needed to run AERMOD 22112, in addition to Microsoft Excel worksheets detailing all emissions inventory calculations.

https://ftps.airsci.com/?ShareToken=D96DC9BF9A4E8D0C31AED462D319ABEA495AA1CA

Appendix C – TAC Emission Rates

Table C-1. TAC Emissions by TEU for Chronic Exposure

CAS	Chemical Name	TEU Emissions (lb/yr) OC	BC	UB	BRWB	UBD	BRWBD	HA	HPO
7440-36-0	Antimony and compounds	7.41E-2	6.81E-1						
7440-38-2	Arsenic and compounds	2.76E-1	2.00E+0			4.93E-3	6.37E-4	1.72E-3	1.72E-3
7440-41-7	Beryllium and compounds	1.95E-3	2.57E-2			3.70E-3	4.77E-4	1.03E-4	1.03E-4
7440-43-9	Cadmium and compounds	3.57E-4	2.95E-3			3.70E-3	4.77E-4	9.45E-3	9.45E-3
18540-29-9	Chromium VI, chromate, and dichromate particulate	4.98E-2	3.24E-1			3.70E-3	4.77E-4	1.20E-2	1.20E-2
7440-48-4	Cobalt and compounds	2.54E-3	3.90E-2					7.21E-4	7.21E-4
7439-92-1	Lead and compounds	1.15E-2	1.17E-1			1.11E-2	1.43E-3		
7439-96-5	Manganese and compounds	1.36E-1	1.37E+0			7.40E-3	9.55E-4	3.26E-3	3.26E-3
7439-97-6	Mercury and compounds	4.00E-3	3.41E-2			3.70E-3	4.77E-4	2.23E-3	2.23E-3
C365	Nickel compounds, insoluble	8.26E-3	6.33E-2			3.70E-3	4.77E-4	1.80E-2	1.80E-2
7440-39-3	Barium and compounds	1.18E+0	1.03E+1					3.78E-2	3.78E-2
7440-50-8	Copper and compounds	3.18E-2	1.39E-1			7.40E-3	9.55E-4	7.30E-3	7.30E-3
7440-62-2	Vanadium (fume or dust)	2.87E-2	2.86E-1					1.98E-2	1.98E-2
7440-66-6	Zinc and compounds	2.94E-2	2.61E-1			4.93E-3	6.37E-4	2.49E-1	2.49E-1
1313-27-5	Molybdenum trioxide	1.57E-2	9.39E-2						
7440-22-4	Silver and compounds	1.67E-2	2.62E-2						
7631-86-9	Silica, crystalline (respirable)	4.32E+2	3.33E+3						
115-07-1	Propylene			1.48E+1	1.91E+0			2.02E+0	2.02E+0
106-99-0	1,3-Butadiene			8.04E-1	1.04E-1				
75-05-8	Acetonitrile			1.06E+1	1.37E+0				
107-02-8	Acrolein			1.06E+0	1.37E-1			4.16E-2	4.16E-2
67-64-1	Acetone			7.19E-1	9.28E-2				
67-63-0	Isopropyl alcohol			1.38E+0	1.77E-1				
107-13-1	Acrylonitrile			2.01E+0	2.59E-1				
71-43-2	Benzene			1.27E+1	1.64E+0			9.59E-2	9.59E-2
108-88-3	Toluene			1.90E+0	2.46E-1			3.14E-1	3.14E-1
100-41-4	Ethyl benzene			1.27E-1	1.64E-2			8.16E-2	8.16E-2
100-42-5	Styrene			9.52E-1	1.23E-1				
108-67-8	1,3,5-Trimethylbenzene			2.96E-1	3.82E-2				
91-20-3	Naphthalene			2.01E+0	2.59E-1			9.58E-3	9.58E-3
7782-49-2	Selenium and compounds					1.85E-2	2.39E-3	2.06E-4	2.06E-4
91-57-6	2-Methyl naphthalene							2.06E-4	2.06E-4
56-49-5	3-Methylcholanthrene							1.55E-5	1.55E-5
57-97-6	7,12-Dimethylbenz[a]anthracene							1.37E-4	1.37E-4
83-32-9	Acenaphthene							1.19E-5	1.19E-5
208-96-8	Acenaphthylene							1.04E-4	1.04E-4
75-07-0	Acetaldehyde							1.20E-1	1.20E-1
7664-41-7	Ammonia							1.55E+2	1.55E+2
120-12-7	Anthracene							1.38E-5	1.38E-5
56-55-3	Benz[a]anthracene							1.68E-5	1.68E-5
50-32-8	Benzo[a]pyrene							8.42E-6	8.42E-6
205-99-2	Benzo[b]fluoranthene							9.79E-6	9.79E-6
191-24-2	Benzo[g,h,i]perylene							1.07E-5	1.07E-5
207-08-9	Benzo[k]fluoranthene							8.50E-6	8.50E-6
218-01-9	Chrysene							1.19E-5	1.19E-5
53-70-3	Dibenz[a,h]anthracene							7.88E-6	7.88E-6
206-44-0	Fluoranthene							1.02E-4	1.02E-4
86-73-7	Fluorene							3.94E-5	3.94E-5
50-00-0	Formaldehyde							6.36E-1	6.36E-1
110-54-3	Hexane							1.55E+1	1.55E+1
193-39-5	Indeno[1,2,3-cd]pyrene							1.00E-5	1.00E-5
106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)							1.03E-2	1.03E-2
85-01-8	Phenanthrene							2.89E-4	2.89E-4
129-00-0	Pyrene							4.81E-5	4.81E-5
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene							2.34E-1	2.34E-1

Table C-1. TAC Emissions by TEU for Chronic Exposure (cont.)

CAS	Chemical Name	TEU Emissions (lb/yr) HL	HWW	HTW	HMO	CKD	EW	MR	MFP
7440-36-0	Antimony and compounds					2.18E-2			2.12E-2
7440-38-2	Arsenic and compounds	1.72E-3	1.72E-3	3.44E-3	1.72E-3	8.11E-2			7.88E-2
7440-41-7	Beryllium and compounds	1.03E-4	1.03E-4	2.06E-4	1.03E-4	5.73E-4			5.57E-4
7440-43-9	Cadmium and compounds	9.45E-3	9.45E-3	1.89E-2	9.45E-3	1.05E-4			1.02E-4
18540-29-9	Chromium VI, chromate, and dichromate particulate	1.20E-2	1.20E-2	2.40E-2	1.20E-2	1.46E-2			1.42E-2
7440-48-4	Cobalt and compounds	7.21E-4	7.21E-4	1.44E-3	7.21E-4	7.46E-4			7.26E-4
7439-92-1	Lead and compounds					3.39E-3			3.30E-3
7439-96-5	Manganese and compounds	3.26E-3	3.26E-3	6.53E-3	3.26E-3	3.99E-2			3.88E-2
7439-97-6	Mercury and compounds	2.23E-3	2.23E-3	4.47E-3	2.23E-3	2.08E+0	5.05E+0	2.35E-1	
C365	Nickel compounds, insoluble	1.80E-2	1.80E-2	3.61E-2	1.80E-2	2.43E-3			2.36E-3
7440-39-3	Barium and compounds	3.78E-2	3.78E-2	7.56E-2	3.78E-2	3.48E-1			3.38E-1
7440-50-8	Copper and compounds	7.30E-3	7.30E-3	1.46E-2	7.30E-3	9.36E-3			9.11E-3
7440-62-2	Vanadium (fume or dust)	1.98E-2	1.98E-2	3.95E-2	1.98E-2	8.44E-3			8.21E-3
7440-66-6	Zinc and compounds	2.49E-1	2.49E-1	4.98E-1	2.49E-1	8.64E-3			8.41E-3
1313-27-5	Molybdenum trioxide					4.62E-3			4.49E-3
7440-22-4	Silver and compounds					4.91E-3			4.78E-3
7631-86-9	Silica, crystalline (respirable)					3.34E+2			3.25E+2
115-07-1	Propylene	2.02E+0	2.02E+0	4.03E+0	2.02E+0				
107-02-8	Acrolein	4.16E-2	4.16E-2	8.31E-2	4.16E-2				
71-43-2	Benzene	9.59E-2	9.59E-2	1.92E-1	9.59E-2				
108-88-3	Toluene	3.14E-1	3.14E-1	6.29E-1	3.14E-1				
100-41-4	Ethyl benzene	8.16E-2	8.16E-2	1.63E-1	8.16E-2				
91-20-3	Naphthalene	9.58E-3	9.58E-3	1.92E-2	9.58E-3				
7782-49-2	Selenium and compounds	2.06E-4	2.06E-4	4.12E-4	2.06E-4				
91-57-6	2-Methyl naphthalene	2.06E-4	2.06E-4	4.12E-4	2.06E-4				
56-49-5	3-Methylcholanthrene	1.55E-5	1.55E-5	3.09E-5	1.55E-5				
57-97-6	7,12-Dimethylbenz[a]anthracene	1.37E-4	1.37E-4	2.75E-4	1.37E-4				
83-32-9	Acenaphthene	1.19E-5	1.19E-5	2.39E-5	1.19E-5				
208-96-8	Acenaphthylene	1.04E-4	1.04E-4	2.08E-4	1.04E-4				
75-07-0	Acetaldehyde	1.20E-1	1.20E-1	2.40E-1	1.20E-1				
7664-41-7	Ammonia	1.55E+2	1.55E+2	3.09E+2	1.55E+2				
120-12-7	Anthracene	1.38E-5	1.38E-5	2.77E-5	1.38E-5				
56-55-3	Benz[a]anthracene	1.68E-5	1.68E-5	3.37E-5	1.68E-5				
50-32-8	Benzo[a]pyrene	8.42E-6	8.42E-6	1.68E-5	8.42E-6				
205-99-2	Benzo[b]fluoranthene	9.79E-6	9.79E-6	1.96E-5	9.79E-6				
191-24-2	Benzo[g,h,i]perylene	1.07E-5	1.07E-5	2.15E-5	1.07E-5				
207-08-9	Benzo[k]fluoranthene	8.50E-6	8.50E-6	1.70E-5	8.50E-6				
218-01-9	Chrysene	1.19E-5	1.19E-5	2.39E-5	1.19E-5				
53-70-3	Dibenz[a,h]anthracene	7.88E-6	7.88E-6	1.58E-5	7.88E-6				
206-44-0	Fluoranthene	1.02E-4	1.02E-4	2.04E-4	1.02E-4				
86-73-7	Fluorene	3.94E-5	3.94E-5	7.88E-5	3.94E-5				
50-00-0	Formaldehyde	6.36E-1	6.36E-1	1.27E+0	6.36E-1				
110-54-3	Hexane	1.55E+1	1.55E+1	3.09E+1	1.55E+1				
193-39-5	Indeno[1,2,3-cd]pyrene	1.00E-5	1.00E-5	2.01E-5	1.00E-5				
106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)	1.03E-2	1.03E-2	2.06E-2	1.03E-2				
85-01-8	Phenanthrene	2.89E-4	2.89E-4	5.79E-4	2.89E-4				
129-00-0	Pyrene	4.81E-5	4.81E-5	9.62E-5	4.81E-5				
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.34E-1	2.34E-1	4.67E-1	2.34E-1				
74-90-8	Cyanide, Hydrogen						4.00E+1		

Table C-1. TAC Emissions by TEU for Chronic Exposure (cont.)

CAS	Chemical Name	TEU Emissions (lb/yr) MFHG	UFD	AFD	TSF	POND	LEACH1	LEACH2	CILTANK1
7440-36-0	Antimony and compounds		1.27E-2	1.44E-1					
7440-38-2	Arsenic and compounds		4.59E-2	4.42E-1					
7440-41-7	Beryllium and compounds		3.50E-4	5.12E-3					
7440-43-9	Cadmium and compounds		6.03E-5	6.34E-4					
18540-29-9	Chromium VI, chromate, and dichromate particulate		8.22E-3	7.33E-2					
7440-48-4	Cobalt and compounds		4.68E-4	7.64E-3					
7439-92-1	Lead and compounds		1.99E-3	2.42E-2					
7439-96-5	Manganese and compounds		2.34E-2	2.84E-1					
7439-97-6	Mercury and compounds	1.04E+0	6.78E-4	7.29E-3					
C365	Nickel compounds, insoluble		1.38E-3	1.38E-2					
7440-39-3	Barium and compounds		2.01E-1	2.20E+0					
7440-50-8	Copper and compounds		5.10E-3	3.50E-2					
7440-62-2	Vanadium (fume or dust)		4.95E-3	5.95E-2					
7440-66-6	Zinc and compounds		5.00E-3	5.54E-2					
1313-27-5	Molybdenum trioxide		2.57E-3	2.17E-2					
7440-22-4	Silver and compounds		2.57E-3	1.03E-2					
7631-86-9	Silica, crystalline (respirable)		9.59E+1	9.90E+2					
74-90-8	Cyanide, Hydrogen				1.26E+3	2.58E+2	4.19E+2	4.19E+2	2.09E+2

Table C-1. TAC Emissions by TEU for Chronic Exposure (cont.)

CAS	Chemical Name	TEU Emissions (lb/yr) CILTANK2	CILTANK3	CILTANK4	CILTANK5	CILTANK6	CILTANK7	CEM1	CEM2
7440-38-2	Arsenic and compounds							2.67E-3	2.67E-3
7440-41-7	Beryllium and compounds							2.43E-4	2.43E-4
7440-43-9	Cadmium and compounds							7.61E-5	7.61E-5
18540-29-9	Chromium VI, chromate, and dichromate particulate							3.64E-3	3.64E-3
7439-92-1	Lead and compounds							1.53E-3	1.53E-3
7439-96-5	Manganese and compounds							2.55E-3	2.55E-3
C365	Nickel compounds, insoluble							6.60E-3	6.60E-3
7631-86-9	Silica, crystalline (respirable)							1.27E-1	1.27E-1
7782-49-2	Selenium and compounds							1.88E-4	1.88E-4
74-90-8	Cyanide, Hydrogen	2.09E+2	2.09E+2	2.09E+2	2.09E+2	2.09E+2	2.09E+2		
12185-10-3	Phosphorus, white							1.30E-2	1.30E-2

Table C-1. TAC Emissions by TEU for Chronic Exposure (cont.)

CAS	Chemical Name	TEU Emissions (lb/yr) CEM3	CEM4	CEM5	UDP	EDG1	MFD	EDFP	LS1
7440-36-0	Antimony and compounds	8.34E-2	5.80E-2						
7440-38-2	Arsenic and compounds	2.45E-1	1.70E-1	5.55E-3	2.63E-1	2.19E-2	5.46E-3	2.19E-3	
7440-41-7	Beryllium and compounds	3.14E-3	2.19E-3						
7440-43-9	Cadmium and compounds	3.61E-4	2.51E-4	1.33E-5	2.46E-1	2.06E-2	5.12E-3	2.06E-3	
18540-29-9	Chromium VI, chromate, and dichromate particulate	3.96E-2	2.76E-2	2.38E-3	1.64E-2	1.37E-3	3.42E-4	1.37E-4	
7440-48-4	Cobalt and compounds	4.78E-3	3.32E-3						
7439-92-1	Lead and compounds	1.43E-2	9.94E-3	6.86E-4	1.36E+0	1.14E-1	2.83E-2	1.14E-2	
7439-96-5	Manganese and compounds	1.68E-1	1.17E-1	7.08E-2	5.09E-1	4.25E-2	1.06E-2	4.25E-3	
7439-97-6	Mercury and compounds	4.17E-3	2.90E-3		3.28E-1	2.74E-2	6.83E-3	2.74E-3	
C365	Nickel compounds, insoluble	7.75E-3	5.39E-3	4.65E-3	6.40E-1	5.34E-2	1.33E-2	5.34E-3	
7440-39-3	Barium and compounds	1.27E+0	8.80E-1						
7440-50-8	Copper and compounds	1.70E-2	1.18E-2		6.73E-1	5.62E-2	1.40E-2	5.62E-3	
7440-62-2	Vanadium (fume or dust)	3.50E-2	2.44E-2						
7440-66-6	Zinc and compounds	3.20E-2	2.22E-2		3.68E+0	3.07E-1	7.65E-2	3.07E-2	
1313-27-5	Molybdenum trioxide	1.15E-2	8.00E-3						
7440-22-4	Silver and compounds	3.21E-3	2.24E-3						
7631-86-9	Silica, crystalline (respirable)	5.23E+2	4.43E+2	2.55E-1					1.12E-6
115-07-1	Propylene				7.66E+1	6.40E+0	3.42E-2	6.40E-1	
106-99-0	1,3-Butadiene				3.57E+1	2.98E+0	5.05E-2	2.98E-1	
107-02-8	Acrolein				5.56E+0	4.65E-1	1.20E+0	4.65E-2	
71-43-2	Benzene				3.06E+1	2.55E+0	1.50E-2	2.55E-1	
108-88-3	Toluene				1.73E+1	1.44E+0	1.50E-2	1.44E-1	
100-41-4	Ethyl benzene				1.79E+0	1.49E-1	6.83E-4	1.49E-2	
91-20-3	Naphthalene				3.23E+0	2.70E-1	1.81E-2	2.70E-2	
7782-49-2	Selenium and compounds				3.61E-1	3.01E-2	7.51E-3	3.01E-3	
91-57-6	2-Methyl naphthalene						4.78E-4		
83-32-9	Acenaphthene				5.50E-1	4.59E-2	7.21E-4	4.59E-3	
208-96-8	Acenaphthylene				6.67E-1	5.57E-2	2.22E-4	5.57E-3	
75-07-0	Acetaldehyde				1.29E+2	1.07E+1	1.20E+0	1.07E+0	
7664-41-7	Ammonia				4.76E+2	3.97E+1	9.90E+0	3.97E+0	
120-12-7	Anthracene				6.59E-1	5.50E-2	8.16E-5	5.50E-3	
56-55-3	Benz[a]anthracene				6.41E-1	5.35E-2	4.61E-5	5.35E-3	
50-32-8	Benzo[a]pyrene				5.83E-3	4.86E-4	2.58E-5	4.86E-5	
205-99-2	Benzo[b]fluoranthene				1.10E+0	9.18E-2	2.28E-5	9.18E-3	
191-24-2	Benzo[g,h,i]perylene				4.68E-4	3.91E-5	2.90E-5	3.91E-6	
207-08-9	Benzo[k]fluoranthene				1.10E+0	9.18E-2	2.84E-4	9.18E-3	
218-01-9	Chrysene				5.87E-1	4.90E-2	4.37E-5	4.90E-3	
53-70-3	Dibenz[a,h]anthracene				5.73E-1	4.78E-2	2.22E-5	4.78E-3	
206-44-0	Fluoranthene				6.56E-1	5.48E-2	1.13E-4	5.48E-3	
86-73-7	Fluorene				3.47E+0	2.89E-1	4.00E-4	2.89E-2	
50-00-0	Formaldehyde				2.83E+2	2.37E+1	1.20E+0	2.37E+0	
110-54-3	Hexane				4.42E+0	3.69E-1	1.20E-2	3.69E-2	
193-39-5	Indeno[1,2,3-cd]pyrene				5.68E-1	4.74E-2	2.27E-5	4.74E-3	
85-01-8	Phenanthrene				6.40E+0	5.34E-1	1.27E-3	5.34E-2	
129-00-0	Pyrene				1.38E+0	1.15E-1	1.39E-4	1.15E-2	
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene				6.96E+1	5.81E+0	5.46E-3	5.81E-1	
12185-10-3	Phosphorus, white			3.00E-2					
108-90-7	Chlorobenzene				3.28E-2	2.74E-3	6.83E-4	2.74E-4	
7647-01-0	Hydrochloric Acid				3.06E+1	2.55E+0	6.36E-1	2.55E-1	
C200	Diesel Particulate Matter				5.50E+3	1.69E+3		1.69E+2	
192-97-2	Benzo[e]pyrene						4.78E-5		
198-55-0	Perylene						9.26E-5		

Table C-1. TAC Emissions by TEU for Chronic Exposure (cont.)

CAS	Chemical Name	TEU Emissions (lb/yr) LS2	TG1	TD1	TD2
7439-97-6	Mercury and compounds			3.27E-6	3.44E-7
7631-86-9	Silica, crystalline (respirable)	9.20E-6			
71-43-2	Benzene		3.33E+1	6.87E-5	7.22E-6
108-88-3	Toluene		1.34E+2	2.62E-3	2.75E-4
100-41-4	Ethyl benzene		2.97E+1	1.06E-3	1.12E-4
100-42-5	Styrene			2.62E-3	2.75E-4
91-20-3	Naphthalene		8.22E+0	4.50E-2	4.73E-3
110-54-3	Hexane		1.32E+2	8.18E-2	8.60E-3
85-01-8	Phenanthrene			1.02E-2	1.08E-3
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		1.33E+2	2.37E-2	2.49E-3
92-52-4	Biphenyl		1.85E-1	8.18E-3	8.60E-4
110-82-7	Cyclohexane		4.45E+0		
108-95-2	Phenol		1.02E+0	5.24E-3	5.50E-4
95-63-6	1,2,4-Trimethylbenzene		4.63E+1	8.18E-2	8.60E-3
98-82-8	Isopropylbenzene (Cumene)		9.26E+0		

Table C-2. TAC Emissions by TEU for Acute Exposure

CAS	Chemical Name	TEU Emissions (lb/day) OC	BC	UB	BRWB	UBD	BRWBD	HA	HPO
7440-36-0	Antimony and compounds	2.03E-4	2.62E-3						
7440-38-2	Arsenic and compounds	7.55E-4	7.70E-3			2.37E-5	2.45E-6	4.71E-6	4.71E-6
7440-41-7	Beryllium and compounds	5.34E-6	9.87E-5			1.78E-5	1.84E-6	2.82E-7	2.82E-7
7440-43-9	Cadmium and compounds	9.79E-7	1.13E-5			1.78E-5	1.84E-6	2.59E-5	2.59E-5
18540-29-9	Chromium VI, chromate, and dichromate particulate	1.36E-4	1.24E-3			1.78E-5	1.84E-6	3.29E-5	3.29E-5
7440-48-4	Cobalt and compounds	6.95E-6	1.50E-4					1.98E-6	1.98E-6
7439-92-1	Lead and compounds	3.16E-5	4.49E-4			5.34E-5	5.51E-6		
7439-96-5	Manganese and compounds	3.71E-4	5.27E-3			3.56E-5	3.67E-6	8.94E-6	8.94E-6
7439-97-6	Mercury and compounds	1.10E-5	1.31E-4			1.78E-5	1.84E-6	6.12E-6	6.12E-6
C365	Nickel compounds, insoluble	2.26E-5	2.43E-4			1.78E-5	1.84E-6	4.94E-5	4.94E-5
7440-39-3	Barium and compounds	3.24E-3	3.97E-2					1.04E-4	1.04E-4
7440-50-8	Copper and compounds	8.72E-5	5.33E-4			3.56E-5	3.67E-6	2.00E-5	2.00E-5
7440-62-2	Vanadium (fume or dust)	7.86E-5	1.10E-3					5.41E-5	5.41E-5
7440-66-6	Zinc and compounds	8.05E-5	1.00E-3			2.37E-5	2.45E-6	6.82E-4	6.82E-4
1313-27-5	Molybdenum trioxide	4.30E-5	3.61E-4						
7440-22-4	Silver and compounds	4.57E-5	1.01E-4						
7631-86-9	Silica, crystalline (respirable)	1.18E+0	1.28E+1						
115-07-1	Propylene			7.12E-2	7.35E-3			5.52E-3	5.52E-3
106-99-0	1,3-Butadiene			3.87E-3	3.99E-4				
75-05-8	Acetonitrile			5.09E-2	5.25E-3				
107-02-8	Acrolein			5.09E-3	5.25E-4			1.14E-4	1.14E-4
67-64-1	Acetone			3.46E-3	3.57E-4				
67-63-0	Isopropyl alcohol			6.61E-3	6.83E-4				
107-13-1	Acrylonitrile			9.66E-3	9.98E-4				
71-43-2	Benzene			6.10E-2	6.30E-3			2.63E-4	2.63E-4
108-88-3	Toluene			9.16E-3	9.45E-4			8.61E-4	8.61E-4
100-41-4	Ethyl benzene			6.10E-4	6.30E-5			2.24E-4	2.24E-4
100-42-5	Styrene			4.58E-3	4.73E-4				
108-67-8	1,3,5-Trimethylbenzene			1.42E-3	1.47E-4				
91-20-3	Naphthalene			9.66E-3	9.98E-4			2.62E-5	2.62E-5
7782-49-2	Selenium and compounds					8.90E-5	9.18E-6	5.65E-7	5.65E-7
91-57-6	2-Methyl naphthalene							5.65E-7	5.65E-7
56-49-5	3-Methylcholanthrene							4.24E-8	4.24E-8
57-97-6	7,12-Dimethylbenz[a]anthracene							3.76E-7	3.76E-7
83-32-9	Acenaphthene							3.27E-8	3.27E-8
208-96-8	Acenaphthylene							2.85E-7	2.85E-7
75-07-0	Acetaldehyde							3.29E-4	3.29E-4
7664-41-7	Ammonia							4.24E-1	4.24E-1
120-12-7	Anthracene							3.79E-8	3.79E-8
56-55-3	Benz[a]anthracene							4.61E-8	4.61E-8
50-32-8	Benzo[a]pyrene							2.31E-8	2.31E-8
205-99-2	Benzo[b]fluoranthene							2.68E-8	2.68E-8
191-24-2	Benzo[g,h,i]perylene							2.94E-8	2.94E-8
207-08-9	Benzo[k]fluoranthene							2.33E-8	2.33E-8
218-01-9	Chrysene							3.27E-8	3.27E-8
53-70-3	Dibenz[a,h]anthracene							2.16E-8	2.16E-8
206-44-0	Fluoranthene							2.80E-7	2.80E-7
86-73-7	Fluorene							1.08E-7	1.08E-7
50-00-0	Formaldehyde							1.74E-3	1.74E-3
110-54-3	Hexane							4.24E-2	4.24E-2
193-39-5	Indeno[1,2,3-cd]pyrene							2.75E-8	2.75E-8
106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)							2.82E-5	2.82E-5
85-01-8	Phenanthrene							7.93E-7	7.93E-7
129-00-0	Pyrene							1.32E-7	1.32E-7
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene							6.40E-4	6.40E-4

Table C-2. TAC Emissions by TEU for Acute Exposure (cont.)

		TEU Emissions (lb/day)							
CAS	Chemical Name	HL	HWW	HTW	HMO	CKD	EW	MR	MFP
7440-36-0	Antimony and compounds					5.97E-5			4.07E-4
7440-38-2	Arsenic and compounds	4.71E-6	4.71E-6	9.41E-6	4.71E-6	2.22E-4			1.52E-3
7440-41-7	Beryllium and compounds	2.82E-7	2.82E-7	5.65E-7	2.82E-7	1.57E-6			1.07E-5
7440-43-9	Cadmium and compounds	2.59E-5	2.59E-5	5.18E-5	2.59E-5	2.88E-7			1.97E-6
18540-29-9	Chromium VI, chromate, and dichromate particulate	3.29E-5	3.29E-5	6.59E-5	3.29E-5	4.01E-5			2.74E-4
7440-48-4	Cobalt and compounds	1.98E-6	1.98E-6	3.95E-6	1.98E-6	2.04E-6			1.40E-5
7439-92-1	Lead and compounds					9.29E-6			6.34E-5
7439-96-5	Manganese and compounds	8.94E-6	8.94E-6	1.79E-5	8.94E-6	1.09E-4			7.46E-4
7439-97-6	Mercury and compounds	6.12E-6	6.12E-6	1.22E-5	6.12E-6	1.25E-2	3.03E-2	4.70E-3	
C365	Nickel compounds, insoluble	4.94E-5	4.94E-5	9.88E-5	4.94E-5	6.65E-6			4.54E-5
7440-39-3	Barium and compounds	1.04E-4	1.04E-4	2.07E-4	1.04E-4	9.52E-4			6.50E-3
7440-50-8	Copper and compounds	2.00E-5	2.00E-5	4.00E-5	2.00E-5	2.56E-5			1.75E-4
7440-62-2	Vanadium (fume or dust)	5.41E-5	5.41E-5	1.08E-4	5.41E-5	2.31E-5			1.58E-4
7440-66-6	Zinc and compounds	6.82E-4	6.82E-4	1.36E-3	6.82E-4	2.37E-5			1.62E-4
1313-27-5	Molybdenum trioxide					1.27E-5			8.64E-5
7440-22-4	Silver and compounds					1.34E-5			9.18E-5
7631-86-9	Silica, crystalline (respirable)					9.16E-1			6.25E+0
115-07-1	Propylene	5.52E-3	5.52E-3	1.10E-2	5.52E-3				
107-02-8	Acrolein	1.14E-4	1.14E-4	2.28E-4	1.14E-4				
71-43-2	Benzene	2.63E-4	2.63E-4	5.26E-4	2.63E-4				
108-88-3	Toluene	8.61E-4	8.61E-4	1.72E-3	8.61E-4				
100-41-4	Ethyl benzene	2.24E-4	2.24E-4	4.47E-4	2.24E-4				
91-20-3	Naphthalene	2.62E-5	2.62E-5	5.25E-5	2.62E-5				
7782-49-2	Selenium and compounds	5.65E-7	5.65E-7	1.13E-6	5.65E-7				
91-57-6	2-Methyl naphthalene	5.65E-7	5.65E-7	1.13E-6	5.65E-7				
56-49-5	3-Methylcholanthrene	4.24E-8	4.24E-8	8.47E-8	4.24E-8				
57-97-6	7,12-Dimethylbenz[a]anthracene	3.76E-7	3.76E-7	7.53E-7	3.76E-7				
83-32-9	Acenaphthene	3.27E-8	3.27E-8	6.54E-8	3.27E-8				
208-96-8	Acenaphthylene	2.85E-7	2.85E-7	5.69E-7	2.85E-7				
75-07-0	Acetaldehyde	3.29E-4	3.29E-4	6.58E-4	3.29E-4				
7664-41-7	Ammonia	4.24E-1	4.24E-1	8.47E-1	4.24E-1				
120-12-7	Anthracene	3.79E-8	3.79E-8	7.58E-8	3.79E-8				
56-55-3	Benz[a]anthracene	4.61E-8	4.61E-8	9.22E-8	4.61E-8				
50-32-8	Benzo[a]pyrene	2.31E-8	2.31E-8	4.61E-8	2.31E-8				
205-99-2	Benzo[b]fluoranthene	2.68E-8	2.68E-8	5.36E-8	2.68E-8				
191-24-2	Benzo[g,h,i]perylene	2.94E-8	2.94E-8	5.88E-8	2.94E-8				
207-08-9	Benzo[k]fluoranthene	2.33E-8	2.33E-8	4.66E-8	2.33E-8				
218-01-9	Chrysene	3.27E-8	3.27E-8	6.54E-8	3.27E-8				
53-70-3	Dibenz[a,h]anthracene	2.16E-8	2.16E-8	4.32E-8	2.16E-8				
206-44-0	Fluoranthene	2.80E-7	2.80E-7	5.60E-7	2.80E-7				
86-73-7	Fluorene	1.08E-7	1.08E-7	2.16E-7	1.08E-7				
50-00-0	Formaldehyde	1.74E-3	1.74E-3	3.48E-3	1.74E-3				
110-54-3	Hexane	4.24E-2	4.24E-2	8.47E-2	4.24E-2				
193-39-5	Indeno[1,2,3-cd]pyrene	2.75E-8	2.75E-8	5.51E-8	2.75E-8				
106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)	2.82E-5	2.82E-5	5.65E-5	2.82E-5				
85-01-8	Phenanthrene	7.93E-7	7.93E-7	1.59E-6	7.93E-7				
129-00-0	Pyrene	1.32E-7	1.32E-7	2.64E-7	1.32E-7				
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	6.40E-4	6.40E-4	1.28E-3	6.40E-4				
74-90-8	Cyanide, Hydrogen						1.10E-1		

Table C-2. TAC Emissions by TEU for Acute Exposure (cont.)

CAS	Chemical Name	TEU Emissions (lb/day) MFHG	UFD	AFD	TSF	POND	LEACH1	LEACH2	CILTANK1
7440-36-0	Antimony and compounds		6.08E-5	7.71E-4					
7440-38-2	Arsenic and compounds		2.21E-4	2.34E-3					
7440-41-7	Beryllium and compounds		1.68E-6	2.79E-5					
7440-43-9	Cadmium and compounds		2.90E-7	3.39E-6					
18540-29-9	Chromium VI, chromate, and dichromate particulate		3.95E-5	3.86E-4					
7440-48-4	Cobalt and compounds		2.25E-6	4.19E-5					
7439-92-1	Lead and compounds		9.58E-6	1.31E-4					
7439-96-5	Manganese and compounds		1.13E-4	1.53E-3					
7439-97-6	Mercury and compounds	4.14E-2	3.26E-6	3.90E-5					
C365	Nickel compounds, insoluble		6.65E-6	7.35E-5					
7440-39-3	Barium and compounds		9.65E-4	1.18E-2					
7440-50-8	Copper and compounds		2.45E-5	1.79E-4					
7440-62-2	Vanadium (fume or dust)		2.38E-5	3.21E-4					
7440-66-6	Zinc and compounds		2.40E-5	2.97E-4					
1313-27-5	Molybdenum trioxide		1.24E-5	1.14E-4					
7440-22-4	Silver and compounds		1.24E-5	4.83E-5					
7631-86-9	Silica, crystalline (respirable)		4.61E-1	5.30E+0					
74-90-8	Cyanide, Hydrogen				4.40E+0	1.05E+0	1.15E+0	1.15E+0	5.74E-1

Table C-2. TAC Emissions by TEU for Acute Exposure (cont.)

		TEU Emissions (lb/day)							
CAS	Chemical Name	CILTANK2	CILTANK3	CILTANK4	CILTANK5	CILTANK6	CILTANK7	CEM1	CEM2
7440-38-2	Arsenic and compounds							1.14E-5	1.14E-5
7440-41-7	Beryllium and compounds							1.04E-6	1.04E-6
7440-43-9	Cadmium and compounds							3.25E-7	3.25E-7
18540-29-9	Chromium VI, chromate, and dichromate particulate							1.55E-5	1.55E-5
7439-92-1	Lead and compounds							6.52E-6	6.52E-6
7439-96-5	Manganese and compounds							1.09E-5	1.09E-5
C365	Nickel compounds, insoluble							2.82E-5	2.82E-5
7631-86-9	Silica, crystalline (respirable)							5.44E-4	5.44E-4
7782-49-2	Selenium and compounds							8.03E-7	8.03E-7
74-90-8	Cyanide, Hydrogen	5.74E-1	5.74E-1	5.74E-1	5.74E-1	5.74E-1	5.74E-1		
12185-10-3	Phosphorus, white							5.55E-5	5.55E-5

Table C-2. TAC Emissions by TEU for Acute Exposure (cont.)

		TEU Emissions (lb/day)							
CAS	Chemical Name	CEM3	CEM4	CEM5	UDP	EDG1	MFD	EDFP	LS1
7440-36-0	Antimony and compounds	3.77E-4	2.62E-4						
7440-38-2	Arsenic and compounds	1.11E-3	7.70E-4	2.51E-5	1.26E-3	5.26E-3	5.25E-5	5.26E-4	
7440-41-7	Beryllium and compounds	1.42E-5	9.88E-6						
7440-43-9	Cadmium and compounds	1.63E-6	1.13E-6	6.03E-8	1.18E-3	4.93E-3	4.93E-5	4.93E-4	
18540-29-9	Chromium VI, chromate, and dichromate particulate	1.79E-4	1.25E-4	1.08E-5	7.89E-5	3.29E-4	3.28E-6	3.29E-5	
7440-48-4	Cobalt and compounds	2.16E-5	1.50E-5						
7439-92-1	Lead and compounds	6.46E-5	4.49E-5	3.11E-6	6.55E-3	2.73E-2	2.73E-4	2.73E-3	
7439-96-5	Manganese and compounds	7.58E-4	5.28E-4	3.21E-4	2.45E-3	1.02E-2	1.02E-4	1.02E-3	
7439-97-6	Mercury and compounds	1.89E-5	1.31E-5		1.58E-3	6.58E-3	6.57E-5	6.58E-4	
C365	Nickel compounds, insoluble	3.50E-5	2.44E-5	2.11E-5	3.08E-3	1.28E-2	1.28E-4	1.28E-3	
7440-39-3	Barium and compounds	5.72E-3	3.98E-3						
7440-50-8	Copper and compounds	7.67E-5	5.34E-5		3.24E-3	1.35E-2	1.35E-4	1.35E-3	
7440-62-2	Vanadium (fume or dust)	1.58E-4	1.10E-4						
7440-66-6	Zinc and compounds	1.44E-4	1.00E-4		1.77E-2	7.37E-2	7.36E-4	7.37E-3	
1313-27-5	Molybdenum trioxide	5.19E-5	3.61E-5						
7440-22-4	Silver and compounds	1.45E-5	1.01E-5						
7631-86-9	Silica, crystalline (respirable)	2.36E+0	2.00E+0	1.09E-3					1.87E-7
115-07-1	Propylene				3.69E-1	1.54E+0	3.28E-4	1.54E-1	
106-99-0	1,3-Butadiene				1.72E-1	7.15E-1	4.86E-4	7.15E-2	
107-02-8	Acrolein				2.68E-2	1.11E-1	1.15E-2	1.11E-2	
71-43-2	Benzene				1.47E-1	6.13E-1	1.44E-4	6.13E-2	
108-88-3	Toluene				8.32E-2	3.47E-1	1.44E-4	3.47E-2	
100-41-4	Ethyl benzene				8.60E-3	3.58E-2	6.57E-6	3.58E-3	
91-20-3	Naphthalene				1.55E-2	6.48E-2	1.74E-4	6.48E-3	
7782-49-2	Selenium and compounds				1.74E-3	7.24E-3	7.22E-5	7.24E-4	
91-57-6	2-Methyl naphthalene						4.60E-6		
83-32-9	Acenaphthene				2.64E-3	1.10E-2	6.93E-6	1.10E-3	
208-96-8	Acenaphthylene				3.21E-3	1.34E-2	2.13E-6	1.34E-3	
75-07-0	Acetaldehyde				6.18E-1	2.58E+0	1.15E-2	2.58E-1	
7664-41-7	Ammonia				2.29E+0	9.54E+0	9.52E-2	9.54E-1	
120-12-7	Anthracene				3.17E-3	1.32E-2	7.85E-7	1.32E-3	
56-55-3	Benz[a]anthracene				3.08E-3	1.28E-2	4.43E-7	1.28E-3	
50-32-8	Benzo[a]pyrene				2.80E-5	1.17E-4	2.48E-7	1.17E-5	
205-99-2	Benzo[b]fluoranthene				5.29E-3	2.20E-2	2.19E-7	2.20E-3	
191-24-2	Benzo[g,h,i]perylene				2.25E-6	9.37E-6	2.79E-7	9.37E-7	
207-08-9	Benzo[k]fluoranthene				5.29E-3	2.20E-2	2.73E-6	2.20E-3	
218-01-9	Chrysene				2.82E-3	1.18E-2	4.20E-7	1.18E-3	
53-70-3	Dibenz[a,h]anthracene				2.76E-3	1.15E-2	2.13E-7	1.15E-3	
206-44-0	Fluoranthene				3.15E-3	1.31E-2	1.09E-6	1.31E-3	
86-73-7	Fluorene				1.67E-2	6.94E-2	3.84E-6	6.94E-3	
50-00-0	Formaldehyde				1.36E+0	5.68E+0	1.15E-2	5.68E-1	
110-54-3	Hexane				2.12E-2	8.85E-2	1.15E-4	8.85E-3	
193-39-5	Indeno[1,2,3-cd]pyrene				2.73E-3	1.14E-2	2.18E-7	1.14E-3	
85-01-8	Phenanthrene				3.08E-2	1.28E-1	1.22E-5	1.28E-2	
129-00-0	Pyrene				6.65E-3	2.77E-2	1.34E-6	2.77E-3	
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene				3.35E-1	1.39E+0	5.25E-5	1.39E-1	
12185-10-3	Phosphorus, white			1.36E-4					
108-90-7	Chlorobenzene				1.58E-4	6.58E-4	6.57E-6	6.58E-5	
7647-01-0	Hydrochloric Acid				1.47E-1	6.13E-1	6.12E-3	6.13E-2	
C200	Diesel Particulate Matter				2.64E+1	2.44E+2		2.44E+1	
192-97-2	Benzo[e]pyrene						4.60E-7		
198-55-0	Perylene						8.90E-7		

Table C-2. TAC Emissions by TEU for Acute Exposure (cont.)

CAS	Chemical Name	TEU Emissions (lb/day) LS2	TG1	TD1	TD2
7439-97-6	Mercury and compounds			8.96E-9	9.42E-10
7631-86-9	Silica, crystalline (respirable)	2.52E-8			
71-43-2	Benzene		9.13E-2	1.88E-7	1.98E-8
108-88-3	Toluene		3.66E-1	7.17E-6	7.54E-7
100-41-4	Ethyl benzene		8.15E-2	2.91E-6	3.06E-7
100-42-5	Styrene			7.17E-6	7.54E-7
91-20-3	Naphthalene		2.25E-2	1.23E-4	1.30E-5
110-54-3	Hexane		3.62E-1	2.24E-4	2.36E-5
85-01-8	Phenanthrene			2.80E-5	2.95E-6
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		3.64E-1	6.50E-5	6.83E-6
92-52-4	Biphenyl		5.07E-4	2.24E-5	2.36E-6
110-82-7	Cyclohexane		1.22E-2		
108-95-2	Phenol		2.79E-3	1.43E-5	1.51E-6
95-63-6	1,2,4-Trimethylbenzene		1.27E-1	2.24E-4	2.36E-5
98-82-8	Isopropylbenzene (Cumene)		2.54E-2		

Appendix D – List of CAO Exposure Locations

Because of the large number of Acute receptors, they are excluded here and provided digitally.

Table D-1. Exposure Locations and Zoning Crosswalk for Non-Acute Classified Receptors

Easting	Northing	Risk Classification	OR Zoning Code	Zoning Description
481167.0	4835722.0	Residential	RNG	Federal Range
484473.0	4838898.0	Residential	RNG	Federal Range
486593.0	4842860.0	Residential	EFU80	Exclusive Farm Use 80
485667.0	4843772.0	Residential	EFU80	Exclusive Farm Use 80
467702.0	4839557.0	Worker	RNG	Federal Range
474243.0	4839495.0	Worker	RNG	Federal Range
466286.6	4829470.7	Worker	RNG	Federal Range
451130.0	4857129.0	Child	RC	Residential-Commercial
480485.0	4869487.0	Child	MDR	Medium Density Residential
494402.0	4843162.0	Child	No zoning class	
479000.0	4828500.0	Residential	RNG	Federal Range
479000.0	4829000.0	Residential	No zoning class	
479000.0	4829500.0	Residential	No zoning class	
479000.0	4834500.0	Residential	RNG	Federal Range
479000.0	4835000.0	Residential	No zoning class	
479500.0	4828500.0	Residential	RNG	Federal Range
479500.0	4829000.0	Residential	No zoning class	
479500.0	4829500.0	Residential	No zoning class	
479500.0	4834500.0	Residential	RNG	Federal Range
479500.0	4835000.0	Residential	RNG	Federal Range
480000.0	4832500.0	Residential	RNG	Federal Range
480000.0	4833000.0	Residential	RNG	Federal Range
480000.0	4833500.0	Residential	RNG	Federal Range
480500.0	4830000.0	Residential	No zoning class	
480500.0	4832500.0	Residential	RNG	Federal Range
480500.0	4833000.0	Residential	RNG	Federal Range
481000.0	4835500.0	Residential	RNG	Federal Range
481000.0	4836000.0	Residential	RNG	Federal Range
481500.0	4836000.0	Residential	RNG	Federal Range
428000.0	4832000.0	Residential	RNG	Federal Range
428000.0	4838000.0	Residential	RNG	Federal Range
430000.0	4828000.0	Residential	RNG	Federal Range
434000.0	4816000.0	Residential	RNG	Federal Range
438000.0	4846000.0	Residential	RNG	Federal Range
442000.0	4870000.0	Residential	RNG	Federal Range

Easting	Northing	Risk Classification	OR Zoning Code	Zoning Description
442000.0	4874000.0	Residential	RNG	Federal Range
444000.0	4870000.0	Residential	RNG	Federal Range
444000.0	4872000.0	Residential	RNG	Federal Range
446000.0	4870000.0	Residential	RNG	Federal Range
448000.0	4854000.0	Residential	EFU160	Exclusive Farm Use 160+
448000.0	4856000.0	Residential	EFU160	Exclusive Farm Use 160+
448000.0	4870000.0	Residential	RNG	Federal Range
448000.0	4874000.0	Residential	RNG	Federal Range
450000.0	4854000.0	Residential	RNG	Federal Range
450000.0	4858000.0	Residential	EFU80	Exclusive Farm Use 80
452000.0	4856000.0	Residential	RNG	Federal Range
454000.0	4854000.0	Residential	RNG	Federal Range
454000.0	4858000.0	Residential	EFU80	Exclusive Farm Use 80
454000.0	4860000.0	Residential	EFU160	Exclusive Farm Use 160+
456000.0	4858000.0	Residential	RNG	Federal Range
456000.0	4860000.0	Residential	EFU80	Exclusive Farm Use 80
458000.0	4858000.0	Residential	EFU160	Exclusive Farm Use 160+
458000.0	4860000.0	Residential	RNG	Federal Range
458000.0	4876000.0	Residential	RNG	Federal Range
460000.0	4786000.0	Residential	RNG	Federal Range
460000.0	4860000.0	Residential	EFU80	Exclusive Farm Use 80
460000.0	4876000.0	Residential	RNG	Federal Range
462000.0	4808000.0	Residential	RNG	Federal Range
462000.0	4866000.0	Residential	RNG	Federal Range
466000.0	4866000.0	Residential	EFU80	Exclusive Farm Use 80
466000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
466000.0	4886000.0	Residential	RNG	Federal Range
468000.0	4864000.0	Residential	RNG	Federal Range
468000.0	4866000.0	Residential	EFU80	Exclusive Farm Use 80
468000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
468000.0	4874000.0	Residential	RNG	Federal Range
468000.0	4884000.0	Residential	EFU160	Exclusive Farm Use 160+
468000.0	4886000.0	Residential	EFU80	Exclusive Farm Use 80
470000.0	4864000.0	Residential	EFU80	Exclusive Farm Use 80
470000.0	4866000.0	Residential	EFU80	Exclusive Farm Use 80
470000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
470000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
470000.0	4872000.0	Residential	EFU160	Exclusive Farm Use 160+
470000.0	4882000.0	Residential	EFU80	Exclusive Farm Use 80
470000.0	4884000.0	Residential	EFU80	Exclusive Farm Use 80
470000.0	4886000.0	Residential	EFU80	Exclusive Farm Use 80

Easting	Northing	Risk Classification	OR Zoning Code	Zoning Description
472000.0	4808000.0	Residential	RNG	Federal Range
472000.0	4814000.0	Residential	RNG	Federal Range
472000.0	4816000.0	Residential	RNG	Federal Range
472000.0	4818000.0	Residential	No zoning class	
472000.0	4820000.0	Residential	RNG	Federal Range
472000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
472000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
472000.0	4872000.0	Residential	RNG	Federal Range
472000.0	4880000.0	Residential	RNG	Federal Range
472000.0	4882000.0	Residential	EFU80	Exclusive Farm Use 80
472000.0	4884000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4862000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4864000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4866000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4872000.0	Residential	RNG	Federal Range
474000.0	4878000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4880000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4882000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4884000.0	Residential	EFU160	Exclusive Farm Use 160+
476000.0	4862000.0	Residential	EFU160	Exclusive Farm Use 160+
476000.0	4864000.0	Residential	EFU80	Exclusive Farm Use 80
476000.0	4866000.0	Residential	No zoning class	
476000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
476000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
476000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
476000.0	4878000.0	Residential	EFU80	Exclusive Farm Use 80
476000.0	4880000.0	Residential	EFU80	Exclusive Farm Use 80
476000.0	4882000.0	Residential	RNG	Federal Range
478000.0	4864000.0	Residential	EFU160	Exclusive Farm Use 160+
478000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
478000.0	4870000.0	Residential	RR1	Rural Residential 1 acre
478000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
478000.0	4874000.0	Residential	EFU80	Exclusive Farm Use 80
478000.0	4876000.0	Residential	EFU80	Exclusive Farm Use 80
478000.0	4878000.0	Residential	EFU80	Exclusive Farm Use 80
478000.0	4880000.0	Residential	RNG	Federal Range
480000.0	4866000.0	Residential	RNG	Federal Range
480000.0	4868000.0	Residential	IL	Industrial - Light
480000.0	4870000.0	Residential	No zoning class	

Easting	Northing	Risk Classification	OR Zoning Code	Zoning Description
480000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
480000.0	4874000.0	Residential	EFU80	Exclusive Farm Use 80
482000.0	4866000.0	Residential	RNG	Federal Range
482000.0	4868000.0	Residential	RNG	Federal Range
482000.0	4870000.0	Residential	RR1	Rural Residential 1 acre
482000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
482000.0	4874000.0	Residential	RNG	Federal Range
482000.0	4876000.0	Residential	RNG	Federal Range
484000.0	4850000.0	Residential	EFU160	Exclusive Farm Use 160+
484000.0	4854000.0	Residential	RNG	Federal Range
484000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
484000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
486000.0	4832000.0	Residential	RNG	Federal Range
486000.0	4844000.0	Residential	EFU160	Exclusive Farm Use 160+
486000.0	4848000.0	Residential	EFU80	Exclusive Farm Use 80
486000.0	4850000.0	Residential	EFU80	Exclusive Farm Use 80
486000.0	4852000.0	Residential	EFU80	Exclusive Farm Use 80
486000.0	4854000.0	Residential	EFU80	Exclusive Farm Use 80
486000.0	4862000.0	Residential	RNG	Federal Range
486000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
486000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
486000.0	4874000.0	Residential	RNG	Federal Range
488000.0	4844000.0	Residential	EFU80	Exclusive Farm Use 80
488000.0	4846000.0	Residential	EFU80	Exclusive Farm Use 80
488000.0	4848000.0	Residential	EFU80	Exclusive Farm Use 80
488000.0	4850000.0	Residential	EFU80	Exclusive Farm Use 80
488000.0	4852000.0	Residential	EFU80	Exclusive Farm Use 80
488000.0	4858000.0	Residential	RNG	Federal Range
488000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
488000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
488000.0	4874000.0	Residential	EFU80	Exclusive Farm Use 80
488000.0	4876000.0	Residential	RNG	Federal Range
490000.0	4844000.0	Residential	EFU80	Exclusive Farm Use 80
490000.0	4846000.0	Residential	EFU80	Exclusive Farm Use 80
490000.0	4850000.0	Residential	EFU80	Exclusive Farm Use 80
490000.0	4852000.0	Residential	EFU80	Exclusive Farm Use 80
490000.0	4854000.0	Residential	EFU80	Exclusive Farm Use 80
490000.0	4856000.0	Residential	No zoning class	
490000.0	4868000.0	Residential	EFU160	Exclusive Farm Use 160+
490000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
490000.0	4874000.0	Residential	EFU80	Exclusive Farm Use 80

Easting	Northing	Risk Classification	OR Zoning Code	Zoning Description
492000.0	4822000.0	Residential	RNG	Federal Range
492000.0	4838000.0	Residential	RNG	Federal Range
492000.0	4842000.0	Residential	RNG	Federal Range
492000.0	4844000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4846000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4848000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4850000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4852000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4854000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4856000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4860000.0	Residential	RNG	Federal Range
492000.0	4862000.0	Residential	RNG	Federal Range
492000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4874000.0	Residential	EFU160	Exclusive Farm Use 160+
494000.0	4792000.0	Residential	RNG	Federal Range
494000.0	4794000.0	Residential	RNG	Federal Range
494000.0	4830000.0	Residential	EFU160	Exclusive Farm Use 160+
494000.0	4832000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4834000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4836000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4838000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4840000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4842000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4844000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4846000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4848000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4850000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4852000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4854000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4856000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4860000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4862000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4872000.0	Residential	No zoning class	
494000.0	4874000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4880000.0	Residential	RNG	Federal Range
496000.0	4828000.0	Residential	EFU160	Exclusive Farm Use 160+
496000.0	4830000.0	Residential	EFU80	Exclusive Farm Use 80

Easting	Northing	Risk Classification	OR Zoning Code	Zoning Description
496000.0	4836000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4838000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4840000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4842000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4844000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4846000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4848000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4850000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4852000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4854000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4858000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4860000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4862000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4864000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4874000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4876000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4878000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4852000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4856000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4858000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4860000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4862000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4864000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4866000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4874000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4876000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4878000.0	Residential	EFU80	Exclusive Farm Use 80
500000.0	4860000.0	Residential	MDR	Medium Density Residential
500000.0	4862000.0	Residential	EFU80	Exclusive Farm Use 80
500000.0	4864000.0	Residential	EFU80	Exclusive Farm Use 80
500000.0	4866000.0	Residential	EFU80	Exclusive Farm Use 80
500000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
500000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
500000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
500000.0	4874000.0	Residential	EFU160	Exclusive Farm Use 160+
500000.0	4876000.0	Residential	IH	Industrial - Heavy

Easting	Northing	Risk Classification	OR Zoning Code	Zoning Description
502000.0	4864000.0	Residential	EFU80	Exclusive Farm Use 80
502000.0	4866000.0	Residential	EFU80	Exclusive Farm Use 80
502000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
502000.0	4874000.0	Residential	PF	Public & semi-public Uses
504000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
504000.0	4874000.0	Residential	MHDR	Medium High Density Residential

Appendix E – Emissions Inventory Worksheets

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: M. Mavko
	PROJECT NO: 343-1	PAGE: 1 OF: 1 SHEET: Summary
AIR EMISSION CALCULATIONS	SUBJECT: Summary	DATE: July 18, 2022

Facility-Wide Emissions

	chk	chk	chk	chk	chk	chk
	PM10	**PM2.5**	**CO**	**NOX**	**SO2**	**VOC**
Activity	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr
Process	4.7	1.5	8.0	5.9	0.656	1.6
Mine	10.8	1.1	10.9	1.7	0.001	--
Nonroad	0.5	0.5	10.5	9.7	0.017	9.6
Total	16.0	3.1	29.4	17.3	0.674	11.2

Short-Term Facility-Wide Emissions

	chk	chk	chk	chk	chk
	PM10	**PM2.5**	**CO**	**NOX**	**SO2**
Activity	lb/day	lb/day	lb/hr	lb/hr	lb/hr
Process	43.5	18.5	18.6	31.1	0.46
Mine	100.9	10.0	179.3	5.4	0.01
Nonroad	5.1	5.1	4.2	3.9	0.01
Total	149.5	33.6	202.2	40.3	0.48

Facility-Wide Emissions - HAP & GHG

	chk	chk
	HAP	**GHG**
Activity	ton/yr	ton/yr
Process	4.31	4,474
Mine	0.57	--
Nonroad	3.34	1,840
Tanks	0.27	--
HCN	1.93	--
Total	10.42	6,313

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TAC Emissions Summary

CAS	Pollutant Name	Emissions lb/yr	Emissions ton/yr
106-99-0	1,3-Butadiene	3.3E+0	1.66E-3
91-57-6	2-Methyl naphthalene	1.9E-03	9.60E-7
56-49-5	3-Methylcholanthrene	1.1E-04	5.41E-8
57-97-6	7,12-Dimethylbenz[a]anthracene	9.6E-04	4.81E-7
83-32-9	Acenaphthene	0.05	2.57E-5
208-96-8	Acenaphthylene	0.06	3.11E-5
75-07-0	Acetaldehyde	13.84	6.92E-3
107-02-8	Acrolein	2.00	1.00E-3
7664-41-7	Ammonia	1,136	5.68E-1
120-12-7	Anthracene	6.1E-2	3.04E-5
7440-36-0	Antimony and compounds	0.94	4.70E-4
7440-38-2	Arsenic and compounds	2.90	1.45E-3
7440-39-3	Barium and compounds	14.61	7.31E-3
56-55-3	Benz[a]anthracene	0.06	2.95E-5
71-43-2	Benzene	3.49	1.75E-3
50-32-8	Benzo[a]pyrene	6.2E-04	3.10E-7
205-99-2	Benzo[b]fluoranthene	1.0E-1	5.05E-5
192-97-2	Benzo[e]pyrene	4.8E-05	2.39E-8
191-24-2	Benzo[g,h,i]perylene	1.5E-04	7.36E-8
207-08-9	Benzo[k]fluoranthene	1.0E-1	5.07E-5
7440-41-7	Beryllium and compounds	3.5E-2	1.76E-5
7440-43-9	Cadmium and compounds	0.098	4.91E-5
108-90-7	Chlorobenzene	3.7E-03	1.85E-6
18540-29-9	Chromium VI, chromate, and dichromate p	0.565	2.83E-4
218-01-9	Chrysene	0.054	2.70E-5
7440-48-4	Cobalt and compounds	0.0562	2.81E-5
7440-50-8	Copper and compounds	0.345	1.72E-4
53-70-3	Dibenz[a,h]anthracene	5.3E-2	2.64E-5
C200	Diesel Particulate Matter	1,853.73	9.27E-1
106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)	0.072	3.61E-5
100-41-4	Ethyl benzene	0.736	3.68E-4
206-44-0	Fluoranthene	6.1E-2	3.05E-5
86-73-7	Fluorene	3.2E-1	1.59E-4
50-00-0	Formaldehyde	31.7	1.58E-2
110-54-3	Hexane	108.6	5.43E-2
7647-01-0	Hydrochloric Acid	3.4E+0	1.72E-3
193-39-5	Indeno[1,2,3-cd]pyrene	5.2E-2	2.61E-5
7439-92-1	Lead and compounds	0.316	1.58E-4
7439-96-5	Manganese and compounds	2.026	1.01E-3
7439-97-6	Mercury and compounds	8.50	4.25E-3
1313-27-5	Molybdenum trioxide	0.14	6.91E-5
91-20-3	Naphthalene	0.382	1.91E-4
C365	Nickel compounds, insoluble	0.306	1.53E-4
198-55-0	Perylene	9.3E-05	4.63E-8
85-01-8	Phenanthrene	5.9E-1	2.96E-4
12185-10-3	Phosphorus, white	0.056	2.80E-5

TAC Emissions Summary - continued

CAS	Pollutant Name	Emissions lb/yr	Emissions ton/yr
115-07-1	Propylene	21.2	1.06E-2
129-00-0	Pyrene	0.127	6.37E-5
7782-49-2	Selenium and compounds	4.2E-2	2.12E-5
7631-86-9	Silica, crystalline (respirable)	5.4E+3	2.69E+0
7440-22-4	Silver and compounds	5.8E-2	2.90E-5
108-88-3	Toluene	3.80	1.90E-3
7440-62-2	Vanadium (fume or dust)	0.529	2.65E-4
1330-20-7	Xylene (mixture), including m-	8.03	4.02E-3
7440-66-6	Zinc and compounds	2.52	1.26E-3
Total TAC		8,614	4.31

GHG Emissions Summary

Source Category	CO2e ton/yr
Propane Combustion	4,267
Diesel Combustion	207
Total GHGs	**4,474**

chk-15 cao - chk

Conversions

2,000 lb/ton

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PROPANE COMBUSTION

TAC Emissions - Propane Combustion

		Emission Factor*		Emissions
Pollutant		lb/MMScf	lb/MMBtu**	ton/yr
2-Methyl naphthalene		2.40E-05	2.35E-8	7.21E-07
3-Methylcholanthrene		1.80E-06	1.76E-9	5.41E-08
7,12-Dimethylbenz[a]anthracene		1.60E-05	1.57E-8	4.81E-07
Acenaphthene	***	1.39E-06	1.36E-9	4.18E-08
Acenaphthylene	***	1.21E-05	1.19E-8	3.64E-07
Acetaldehyde	***	1.40E-02	1.37E-5	4.20E-04
Acrolein	***	4.84E-3	4.74E-6	1.45E-4
Ammonia	****	1.80E+01	1.76E-2	5.41E-01
Anthracene	***	1.61E-6	1.58E-9	4.84E-8
Arsenic and compounds		2.00E-4	1.96E-7	6.01E-6
Barium and compounds		4.40E-3	4.31E-6	1.32E-4
Benz[a]anthracene	***	1.96E-6	1.92E-9	5.89E-8
Benzene	***	1.12E-02	1.10E-5	3.36E-4
Benzo[a]pyrene	***	9.80E-7	9.61E-10	2.95E-8
Benzo[b]fluoranthene	***	1.14E-6	1.12E-9	3.43E-8
Benzo[g,h,i]perylene	***	1.25E-6	1.23E-9	3.76E-8
Benzo[k]fluoranthene	***	9.90E-7	9.71E-10	2.98E-8
Beryllium and compounds		1.20E-5	1.18E-8	3.61E-7
Cadmium and compounds		1.10E-3	1.08E-6	3.31E-5
Chromium VI, chromate, and dichromate particul		1.40E-3	1.37E-6	4.21E-5
Chrysene		1.39E-6	1.36E-9	4.18E-8
Cobalt and compounds		8.40E-5	8.24E-8	2.52E-6
Copper and compounds		8.50E-4	8.33E-7	2.56E-5
Dibenz[a,h]anthracene	***	9.17E-7	8.99E-10	2.76E-8
Ethyl benzene	****	9.50E-03	9.31E-6	2.86E-4
Fluoranthene	***	1.19E-5	1.17E-8	3.58E-7
Fluorene	***	4.59E-6	4.50E-9	1.38E-7
Formaldehyde	***	7.40E-02	7.26E-5	2.23E-3
Hexane	***	1.80E+00	1.76E-3	5.41E-02
Indeno[1,2,3-cd]pyrene	***	1.17E-6	1.15E-9	3.52E-8
Manganese and compounds		3.80E-4	3.73E-7	1.14E-5
Mercury and compounds		2.60E-4	2.55E-7	7.82E-6
Naphthalene	***	1.12E-3	1.09E-6	3.35E-5
Nickel compounds, insoluble		2.10E-3	2.06E-6	6.31E-5
p-Dichlorobenzene (1,4-Dichlorobenzene)		1.20E-3	1.18E-6	3.61E-5
Phenanthrene	***	3.37E-5	3.30E-8	1.01E-6
Propylene	***	2.35E-01	2.30E-4	7.06E-3
Pyrene	***	5.60E-6	5.49E-9	1.68E-7
Selenium and compounds		2.40E-5	2.35E-8	7.21E-7
Toluene	****	3.66E-02	3.59E-5	1.10E-3
Vanadium (fume or dust)		2.30E-3	2.25E-6	6.91E-5
Xylene (mixture), including m-xylen	****	2.72E-02	2.67E-5	8.18E-4
Zinc and compounds		2.90E-02	2.84E-5	8.72E-4
Total TAC				6.09E-01

Source Data

Source ID	Description	MMBtu/yr
HA	Administration HVAC	8,760
HPO	Plant Office and Dry HVAC	8,760
HL	Laboratory HVAC	8,760
HWW	Plant Workshop and Warehouse HVAC	8,760
HTW	Truck Workshop and Warehouse HVA(	17,520
HMO	Mine Office and Changehouse HVAC	8,760
Total		61,320

**AP-42, Table 1.4-3 & 1.4-4 (7/98) Natural Gas Combustion*

***Natural Gas Higher Heating Value* 1,020 *MMBtu/MMScf*

****California Air Toxics Emission Factors Database, Natural Gas Heaters (SCC 31000404)*

*****South Coast AQMD Default Emission Factors for Fuel Combustion, Natural Gas Heaters < 10 MMBtu/hr*

Conversions

2,000 lb/ton

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PROPANE COMBUSTION - CONTINUED

Propane CO_2e Emission Factors:	62.87	kg CO2/MMBtu	*40 CFR Part 98, Table C-1 to Subpart C (11/2013) Propane (CFR 2018)*
	3.0E-03	kg CH4/MMBtu	*40 CFR Part 98, Table C-2 to Subpart C (11/2013) Petroleum (CFR 2018)*
	6.0E-04	kg N2O/MMBtu	*40 CFR Part 98, Table C-2 to Subpart C (11/2013) Petroleum (CFR 2018)*

Total Propane Combustion 61,320 MMBtu/yr

Propane CO2e Emissions - Process Sources:

Greenhouse Gas	Emissions ton/yr	Global Warming Potential*	CO2e ton/yr
CO2	4,250	1	4,250
CH4	0.20	25	5
N2O	0.04	298	12
Total GHG			4,267

** 40 CFR 98, Table A-1 (12/2014) (CFR 2018)*

Conversions

907.19 kg/ton

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DIESEL COMBUSTION

TAC Emissions - Diesel Combustion

CAS	Pollutant	Emission Factor* lb/MMBtu	Emissions ton/yr
106-99-0	1,3-Butadiene	1.08E-04	2.53E-05
91-57-6	2-Methyl naphthalene	1.02E-06	2.39E-07
83-32-9	Acenaphthene	1.54E-06	3.60E-07
208-96-8	Acenaphthylene	4.74E-07	1.11E-07
75-07-0	Acetaldehyde	2.56E-03	5.99E-04
107-02-8	Acrolein	2.56E-03	5.99E-04
7664-41-7	Ammonia	2.12E-02	4.95E-03
120-12-7	Anthracene	1.74E-07	4.08E-08
7440-38-2	Arsenic and compounds	1.17E-05	2.73E-06
71-43-2	Benzene	3.21E-05	7.51E-06
56-55-3	Benz[a]anthracene	9.85E-08	2.31E-08
50-32-8	Benzo[a]pyrene	5.51E-08	1.29E-08
205-99-2	Benzo[b]fluoranthene	4.87E-08	1.14E-08
192-97-2	Benzo[e]pyrene	1.02E-07	2.39E-08
191-24-2	Benzo[g,h,i]perylene	6.20E-08	1.45E-08
207-08-9	Benzo[k]fluoranthene	6.07E-07	1.42E-07
7440-43-9	Cadmium and compounds	1.09E-05	2.56E-06
108-90-7	Chlorobenzene	1.46E-06	3.42E-07
218-01-9	Chrysene	9.34E-08	2.19E-08
7440-50-8	Copper and compounds	2.99E-05	7.00E-06
53-70-3	Dibenz[a,h]anthracene	4.74E-08	1.11E-08
100-41-4	Ethyl benzene	1.46E-06	3.42E-07
206-44-0	Fluoranthene	2.42E-07	5.67E-08
86-73-7	Fluorene	8.54E-07	2.00E-07
50-00-0	Formaldehyde	2.56E-03	5.99E-04
110-54-3	Hexane	2.55E-05	5.98E-06
7647-01-0	Hydrochloric Acid	1.36E-03	3.18E-04
18540-29-9	Chromium VI, chromate, and dichromate	7.30E-07	1.71E-07
193-39-5	Indeno[1,2,3-cd]pyrene	4.85E-08	1.13E-08
7439-92-1	Lead and compounds	6.06E-05	1.42E-05
7439-96-5	Manganese and compounds	2.26E-05	5.29E-06
7439-97-6	Mercury and compounds	1.46E-05	3.42E-06
91-20-3	Naphthalene	3.87E-05	9.05E-06
C365	Nickel compounds, insoluble	2.85E-05	6.66E-06
198-55-0	Perylene	1.98E-07	4.63E-08
85-01-8	Phenanthrene	2.72E-06	6.35E-07
115-07-1	Propylene	7.30E-05	1.71E-05
129-00-0	Pyrene	2.98E-07	6.97E-08
7782-49-2	Selenium and compounds	1.61E-05	3.76E-06
108-88-3	Toluene	3.21E-05	7.51E-06
1330-20-7	Xylene (mixture), including m-xylene, o->	1.17E-05	2.73E-06
7440-66-6	Zinc and compounds	1.64E-04	3.83E-05
	Total TACs		7.23E-03

Source Data

Source ID	Description	MMBtu/yr
MF	Melting Furnace	467.9
Total		467.9

Diesel CO2e Emission Factors:

73.96	kg CO2/MMBtu	*40 CFR 98, Table C-1 to Subpart C No.2*
3.0E-03	kg CH4/MMBtu	*40 CFR 98, Table C-2 to Subpart C Petroleum*
6.0E-04	kg N2O/MMBtu	*40 CFR 98, Table C-2 to Subpart C Petroleum*

Diesel CO2e Emissions - Process Sources:

Greenhouse Gas	Emissions ton/yr	Global Warming Potential*	CO2e ton/yr
CO2	38.15	1	38.15
CH4	1.55E-03	25	0.04
N2O	3.09E-04	298	0.09
Total GHG			38.28

** 40 CFR 98, Table A-1 (CFR 2018d)*

* *Based on heating value of* 0.137 *MMBtu/gal*

Acrolein sample calculation

$$\frac{0.351\ \text{lb}}{1{,}000\ \text{gal}} \times \frac{\text{gal}}{0.137\ \text{MMBtu}} \times \frac{467.9\ \text{MMBtu}}{\text{yr}} \times \frac{\text{ton}}{2{,}000\ \text{lb}} = \frac{5.99\text{E-}04\ \text{ton}}{\text{yr}}$$

Conversions

2,000	lb/ton
907.19	kg/ton
1.341	hp/kW
1E+6	Btu/MMBtu

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DIESEL COMBUSTION - CONTINUED

TAC	CATEF[1] lbs/Mgal ICE	VCAPCD[2] lbs/Mgal ICE	SCAQMD[3] lbs/Mgal ICE	ODEQ[4] lbs/Mgal	Final ODEQ or Max
1,3-Butadiene		0.0148	0.0148	0.0148	0.015
2-Chloronaphthalene	1.84E-05				1.84E-05
2-Methyl naphthalene	1.40E-04				1.40E-04
Acenaphthene	2.11E-04				2.11E-04
Acenaphthylene	6.50E-05				6.50E-05
Acetaldehyde		0.3506	0.3506	0.3506	0.351
Acrolein		0.3506	0.3506	0.3506	0.351
Ammonia			2.9	2.9	2.900
Anthracene	2.39E-05				2.39E-05
Arsenic and compounds		1.60E-03	1.60E-03	1.60E-03	1.60E-03
Benzene	2.54E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03
Benz[a]anthracene	1.35E-05				1.35E-05
Benzo[a]pyrene	7.55E-06				7.55E-06
Benzo[b]fluoranthene	6.67E-06				6.67E-06
Benzo[e]pyrene	1.40E-05				1.40E-05
Benzo[g,h,i]perylene	8.50E-06				8.50E-06
Benzo[k]fluoranthene	8.31E-05				8.31E-05
Cadmium and compounds		1.50E-03	1.50E-03	1.50E-03	1.50E-03
Chlorobenzene		2.00E-04			2.00E-04
Chrysene	1.28E-05				1.28E-05
Copper and compounds		4.10E-03	4.10E-03	4.10E-03	4.10E-03
Dibenz[a,h]anthracene	6.49E-06				6.49E-06
Ethyl benzene	1.49E-03	2.00E-04	2.00E-04	2.00E-04	2.00E-04
Fluoranthene	3.32E-05				3.32E-05
Fluorene	1.17E-04				1.17E-04
Formaldehyde	0.349	0.3506	0.3506	0.3506	0.351
Hexane	1.21E-03	3.50E-03	3.50E-03	3.50E-03	3.50E-03
Hydrochloric Acid				0.1863	0.186
Hydrogen Chloride		0.1863	0.1863		0.186
Chromium VI, chromate, and dichromate particu		6.00E-04	1.00E-04	1.00E-04	1.00E-04
Indeno[1,2,3-cd]pyrene	6.64E-06				6.64E-06
Lead and compounds		0.0083	0.0083	0.0083	0.008
Manganese and compounds		3.10E-03	3.10E-03	3.10E-03	3.10E-03
Mercury and compounds		2.00E-03	2.00E-03	2.00E-03	2.00E-03
Naphthalene	0.367	0.0053	0.0053	0.0053	0.005
Nickel compounds, insoluble		3.90E-03	3.90E-03	3.90E-03	3.90E-03
Perylene	2.71E-05				2.71E-05
Phenanthrene	3.72E-04				3.72E-04
Propylene	1.71E-03	0.01			0.010
Pyrene	4.08E-05				4.08E-05
Selenium and compounds		2.20E-03	2.20E-03	2.20E-03	2.20E-03
Toluene	1.50E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03
Xylene (mixture), including m-xylene,	1.49E-03	1.60E-03	1.60E-03	1.60E-03	1.60E-03
Zinc and compounds		0.0224			0.022

[1] *(CARB 2000)*

[2] *(VCAPCD 2001)*

[3] *(AQMD 2020)*

[4] *(ODEQ 2020)*

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DIESEL COMBUSTION - CONTINUED

Emergency Operations

	EDG1	EDFP
Starts per year for maintenance, 1 per month	12	12
Hours per year non-emergency operations	100	100
kW	2,000	200
MMBtu/yr	1,877.4	187.7
MMBtu/hr	18.77	1.88

Air Sciences recommended value/estimated from similar mine operations

TAC Emissions - Emergency Generator & Fire Pump Diesel Combustion

Description	Emission Factors				Daily		Annual	
	PM		VOC					
Cold start operations, 30 minutes per start*	4.16	lb/MMBtu	5.28	lb/MMBtu	0.5	hr	6	hr
Steady state operation, non-emergency**	0.05	lb/MMBtu	0.31	lb/MMBtu	23.5	hr	94	hr
Total Weighted Emission Factor					0.542	lb/MMBtu	0.898	lb/MMBtu

* *(UCR 2005)*

** *40 CFR Subpart 60.4202(a)(2); SO2 - mass balance (15 ppm ULSD) (CFR 2018b)*

Source ID	Description		Emissions			
			lb/hr	lb/day	lb/yr	ton/yr
EDG1	Emergency Generator (Mfr. Yr. >2007; diesel)	(as PM2.5+VOC)	16.85	244.05	1,685.2	0.84
EDFP	Emergency Diesel Fire Pump	(as PM2.5+VOC)	1.69	24.41	168.5	8.4E-02

Conversions

2,000	lb/ton
453.59	g/lb
1.341	hp/kW
1E+6	Btu/MMBtu

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DIESEL COMBUSTION - CONTINUED

Source Data

		Power Rating		Operatior	Fuel Consumption	
Source ID	**Description**	kW	hp	hr/yr	MMBtu/hr*	MMBtu/yr
EDG1	Emergency Generator (Mfr. Yr. >2007; diesel)	2,000	2,682	100	18.77	1,877.4
EDFP	Emergency Diesel Fire Pump	200	268	100	1.88	187.7
Total						2,065.1

** Based on brake specific fuel consumption for diesel generators* 7,000 *Btu/hp-hr AP-42 Tbl 3.3-1*

TAC Emissions - Diesel Combustion

	Emission Factor*	EDG1	EDFP	Total
Pollutant	lb/MMBtu	ton/yr	ton/yr	ton/yr
1,3-Butadiene	1.59E-03	1.49E-03	1.49E-04	1.64E-03
Acenaphthene	2.45E-05	2.30E-05	2.30E-06	2.53E-05
Acenaphthylene	2.97E-05	2.79E-05	2.79E-06	3.06E-05
Acetaldehyde	5.72E-03	5.37E-03	5.37E-04	5.90E-03
Acrolein	2.47E-04	2.32E-04	2.32E-05	2.56E-04
Ammonia	2.12E-02	1.99E-02	1.99E-03	2.19E-02
Anthracene	2.93E-05	2.75E-05	2.75E-06	3.03E-05
Arsenic and compounds	1.17E-05	1.10E-05	1.10E-06	1.21E-05
Benzene	1.36E-03	1.28E-03	1.28E-04	1.40E-03
Benz[a]anthracene	2.85E-05	2.67E-05	2.67E-06	2.94E-05
Benzo[a]pyrene	2.59E-07	2.43E-07	2.43E-08	2.68E-07
Benzo[b]fluoranthene	4.89E-05	4.59E-05	4.59E-06	5.05E-05
Benzo[g,h,i]perylene	2.08E-08	1.95E-08	1.95E-09	2.15E-08
Benzo[k]fluoranthene	4.89E-05	4.59E-05	4.59E-06	5.05E-05
Cadmium and compounds	1.09E-05	1.03E-05	1.03E-06	1.13E-05
Chlorobenzene	1.46E-06	1.37E-06	1.37E-07	1.51E-06
Chrysene	2.61E-05	2.45E-05	2.45E-06	2.70E-05
Copper and compounds	2.99E-05	2.81E-05	2.81E-06	3.09E-05
Dibenz[a,h]anthracene	2.55E-05	2.39E-05	2.39E-06	2.63E-05
Ethyl benzene	7.96E-05	7.47E-05	7.47E-06	8.22E-05
Fluoranthene	2.92E-05	2.74E-05	2.74E-06	3.01E-05
Fluorene	1.54E-04	1.45E-04	1.45E-05	1.59E-04
Formaldehyde	1.26E-02	1.18E-02	1.18E-03	1.30E-02
Hexane	1.96E-04	1.84E-04	1.84E-05	2.03E-04
Hydrochloric Acid	1.36E-03	1.28E-03	1.28E-04	1.40E-03
Chromium VI, chromate, and dichromate	7.30E-07	6.85E-07	6.85E-08	7.54E-07
Indeno[1,2,3-cd]pyrene	2.53E-05	2.37E-05	2.37E-06	2.61E-05
Lead and compounds	6.06E-05	5.69E-05	5.69E-06	6.26E-05
Manganese and compounds	2.26E-05	2.12E-05	2.12E-06	2.34E-05
Mercury and compounds	1.46E-05	1.37E-05	1.37E-06	1.51E-05
Naphthalene	1.44E-04	1.35E-04	1.35E-05	1.48E-04
Nickel compounds, insoluble	2.85E-05	2.67E-05	2.67E-06	2.94E-05
Phenanthrene	2.85E-04	2.67E-04	2.67E-05	2.94E-04
Propylene	3.41E-03	3.20E-03	3.20E-04	3.52E-03
Pyrene	6.15E-05	5.77E-05	5.77E-06	6.35E-05
Selenium and compounds	1.61E-05	1.51E-05	1.51E-06	1.66E-05
Toluene	7.69E-04	7.22E-04	7.22E-05	7.94E-04
Xylene (mixture), including m-xylene, o-x	3.09E-03	2.91E-03	2.91E-04	3.20E-03
Zinc and compounds	1.64E-04	1.53E-04	1.53E-05	1.69E-04
Total TACs		4.97E-02	4.97E-03	5.46E-02

**oregon.gov/deq/aq/cao/Pagess/faq-step2.aspx*

Based on heating value of 0.137 *MMBtu/gal*

Diesel CO2e Emission Factors:

73.96 kg CO_2/MMBtu *40 CFR 98, Table C-1 to Subpart C No.2*

3.0E-03 kg CH_4/MMBtu *40 CFR 98, Table C-2 to Subpart C Petroleum*

6.0E-04 kg N_2O/MMBtu *40 CFR 98, Table C-2 to Subpart C Petroleum*

Total Diesel Combustion

2,065.1 MMBtu/yr

Diesel CO2e Emissions - Process Sources:

	Emissions	Global Warn	CO2e
	ton/yr	Potential[a]	ton/yr
CO2	168.36	1	168.36
CH4	6.83E-03	25	0.17
N2O	1.37E-03	298	0.41
Total GHG			168.94

** 40 CFR 98, Table A-1*

Conversions

2,000 lb/ton

907.19 kg/ton

1.341 hp/kW

1E+6 Btu/MMBtu

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DIESEL COMBUSTION - CONTINUED

TAC	CATEF[1] lbs/Mgal ICE	VCAPCD[2] lbs/Mgal ICE	SCAQMD[3] lbs/Mgal ICE	ODEQ[4] lbs/Mgal	Final ODEQ or Max
1,3-Butadiene	0.005413655	0.2174	0.2174	0.2174	2.17E-01
Acenaphthene	3.35E-03				3.35E-03
Acenaphthylene	4.07E-03				4.07E-03
Acetaldehyde	0.106624253	0.7833	0.7833	0.7833	7.83E-01
Acrolein	0.013013381	0.0339	0.0339	0.0339	3.39E-02
Ammonia	4.846100815		2.9	2.9	2.90E+00
Anthracene	4.02E-03				4.02E-03
Arsenic and compounds		1.60E-03	1.60E-03	1.60E-03	1.60E-03
Benzaldehyde	0.012627506				1.26E-02
Benzene	0.284539355	0.1863	0.1863	0.1863	1.86E-01
Benz[a]anthracene	3.90E-03				3.90E-03
Benzo[a]pyrene	3.35E-03			3.55E-05	3.55E-05
Benzo[b]fluoranthene	0.006698514				6.70E-03
Benzo[g,h,i]perylene	2.85E-06				2.85E-06
Benzo[g,h,i]perylene	3.52E-03				3.52E-03
Benzo[k]fluoranthene	0.006698514				6.70E-03
Cadmium and compounds		1.50E-03	1.50E-03	1.50E-03	1.50E-03
Chlorobenzene		2.00E-04			2.00E-04
Chrysene	3.58E-03				3.58E-03
Copper and compounds		4.10E-03	4.10E-03	4.10E-03	4.10E-03
Dibenz[a,h]anthracene	3.49E-03				3.49E-03
Ethyl benzene	0.006756027	0.0109	0.0109	0.0109	1.09E-02
Fluoranthene	4.00E-03				4.00E-03
Fluorene	0.021111882				2.11E-02
Formaldehyde	1.110259061	1.7261	1.7261	1.7261	1.73E+00
Hexane	1.39E-03	0.0269	0.0269	0.0269	2.69E-02
Chromium VI, chromate, and dichromate particulate		1.00E-04	1.00E-04	1.00E-04	1.00E-04
Hydrochloric Acid		0.1863	0.1863	0.1863	1.86E-01
Indeno[1,2,3-cd]pyrene	3.46E-03				3.46E-03
Lead and compounds		0.0083	0.0083	0.0083	8.30E-03
Manganese and compounds		3.10E-03	3.10E-03	3.10E-03	3.10E-03
Mercury and compounds		2.00E-03	2.00E-03	2.00E-03	2.00E-03
Naphthalene	0.056370579	0.0197	0.0197	0.0197	1.97E-02
Nickel compounds, insoluble		3.90E-03	3.90E-03	3.90E-03	3.90E-03
Phenanthrene	0.03899905				3.90E-02
Propylene	0.384712447	0.467			4.67E-01
Pyrene	0.008424086				8.42E-03
Selenium and compounds		2.20E-03	2.20E-03	2.20E-03	2.20E-03
Toluene	0.084963214	0.1054	0.1054	0.1054	1.05E-01
total chromium		6.00E-04			6.00E-04
Xylene (mixture), including m-xylene, c	0.035877015	0.0424	0.0424	0.424	4.24E-01
Zinc and compounds		0.0224			2.24E-02
Polycyclic aromatic hydrocarbons (PAHs)				0.0362	3.62E-02

[1] *(CARB 2000)*

[2] *(VCAPCD 2001)*

[3] *(AQMD 2020)*

[4] *(ODEQ 2020)*

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: M. Mavko
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AIR EMISSION CALCULATIONS	SUBJECT: Process TAC and GHG Emissions	DATE: June 30, 2022

FUGITIVE DUST EMISSIONS

Activity Information

PM Ore and Rock 63.6 % Silica

(Ausenco 2020)

Activity	PM ton/day	PM ton/yr	PM10 ton/day	PM10 ton/yr	
Process Area Crushing	2.45E-03	0.89	9.30E-04	0.34	*See Process Sheet*
Borrow Crushing	2.70E-02	7.01	1.01E-02	2.62	*See Process Sheet*
Batch Plant Borrow Material Handling	6.58E-03	1.46	3.43E-03	0.76	*See Process Sheet*
Ore/Waste Subtotal	3.60E-02	9.36	1.44E-02	3.72	

Ore and Waste Dust TAC Concentrations[1] and Emissions

CAS No.	Pollutant	Ore ppm	Waste ppm	Ore lb/ton	Waste lb/ton	OC lb/ton	BC lb/ton	CEM3 lb/ton	CEM4 lb/ton
7440-38-2	Arsenic and compounds	154.21	142.61	0.3084	0.29	9.25E-07	8.10E-06	9.84E-07	6.85E-07
7440-39-3	Barium and compounds	661.43	736.47	1.3229	1.47	3.97E-06	4.18E-05	5.08E-06	3.54E-06
7440-41-7	Beryllium and compounds	1.09	1.83	0.0022	3.66E-03	6.54E-09	1.04E-07	1.26E-08	8.78E-09
7440-43-9	Cadmium and compounds	0.2	0.21	0.0004	4.20E-04	1.20E-09	1.19E-08	1.45E-09	1.01E-09
7440-48-4	Cobalt and compounds	1.42	2.78	0.0028	0.01	8.52E-09	1.58E-07	1.92E-08	1.33E-08
18540-29-9	Chromium VI, chromate, and dichromate particulate	27.87	23.07	0.0557	0.05	1.67E-07	1.31E-06	1.59E-07	1.11E-07
7440-50-8	Copper and compounds	17.81	9.88	0.0356	0.02	1.07E-07	5.61E-07	6.82E-08	4.74E-08
7439-97-6	Mercury and compounds	2.24	2.43	0.0045	4.86E-03	1.34E-08	1.38E-07	1.68E-08	1.17E-08
7439-96-5	Manganese and compounds	75.84	97.7	0.1517	0.20	4.55E-07	5.55E-06	6.74E-07	4.69E-07
1313-27-5	Molybdenum trioxide	8.79	6.69	0.0176	0.01	5.27E-08	3.80E-07	4.62E-08	3.21E-08
C365	Nickel compounds, insoluble	4.62	4.51	0.0092	0.01	2.77E-08	2.56E-07	3.11E-08	2.16E-08
7439-92-1	Lead and compounds	6.45	8.32	0.0129	0.02	3.87E-08	4.73E-07	5.74E-08	3.99E-08
7440-36-0	Antimony and compounds	41.44	48.53	0.0829	0.10	2.49E-07	2.76E-06	3.35E-07	2.33E-07
7440-62-2	Vanadium (fume or dust)	16.05	20.40	0.0321	0.04	9.63E-08	1.16E-06	1.41E-07	9.79E-08
7440-66-6	Zinc and compounds	16.44	18.60	0.0329	0.04	9.86E-08	1.06E-06	1.28E-07	8.93E-08
7440-22-4	Silver and Compounds	9.34	1.87	0.0187	0.00	5.60E-08	1.06E-07	1.29E-08	8.98E-09
7631-86-9	Silica, crystalline (respirable)	636,000	636,000	1,272.00	1,272.00	1.45E-03	1.35E-02	2.10E-03	1.78E-03

[1] *(Gustin 2022.02.11) TAC concentrations based on Paramount samples. Mercury sampling was not available for Paramount samples, so the historical values were used.*

CAS No.	Pollutant	OC lb/day	BC lb/day	CEM3/4 lb/day	Total lb/day	OC lb/yr	BC lb/yr	CEM3/4 lb/yr	Total [2] lb/yr	Total ton/yr
7440-38-2	Arsenic and compounds	7.55E-04	7.70E-03	1.88E-03	1.0E-02	0.2756	2.00	0.42	2.69	1.3E-3
7440-39-3	Barium and compounds	3.24E-03	3.97E-02	9.69E-03	5.3E-02	1.1820	10.33	2.15	13.66	6.8E-3
7440-41-7	Beryllium and compounds	5.34E-06	9.87E-05	2.41E-05	1.3E-04	0.0019	0.03	0.01	0.03	1.6E-5
7440-43-9	Cadmium and compounds	9.79E-07	1.13E-05	2.76E-06	1.5E-05	0.0004	0.00	0.00	0.00	2.0E-6
7440-48-4	Cobalt and compounds	6.95E-06	1.50E-04	3.66E-05	1.9E-04	0.0025	0.04	0.01	0.05	2.5E-5
18540-29-9	Chromium VI, chromate, and dichromate particulate	1.36E-04	1.24E-03	3.04E-04	1.7E-03	0.0498	0.32	0.07	0.44	2.2E-4
7440-50-8	Copper and compounds	8.72E-05	5.33E-04	1.30E-04	7.5E-04	0.0318	0.14	0.03	0.20	1.0E-4
7439-97-6	Mercury and compounds	1.10E-05	1.31E-04	3.20E-05	1.7E-04	0.0040	0.03	0.01	0.05	2.3E-5
7439-96-5	Manganese and compounds	3.71E-04	5.27E-03	1.29E-03	6.9E-03	0.1355	1.37	0.28	1.79	9.0E-4
1313-27-5	Molybdenum trioxide	4.30E-05	3.61E-04	8.81E-05	4.9E-04	0.0157	0.09	0.02	0.13	6.5E-5
C365	Nickel compounds, insoluble	2.26E-05	2.43E-04	5.94E-05	3.3E-04	0.0083	0.06	0.01	0.08	4.2E-5
7439-92-1	Lead and compounds	3.16E-05	4.49E-04	1.10E-04	5.9E-04	0.0115	0.12	0.02	0.15	7.6E-5
7440-36-0	Antimony and compounds	2.03E-04	2.62E-03	6.39E-04	3.5E-03	0.0741	0.68	0.14	0.90	4.5E-4
7440-62-2	Vanadium (fume or dust)	7.86E-05	1.10E-03	2.69E-04	1.4E-03	0.0287	0.29	0.06	0.37	1.9E-4
7440-66-6	Zinc and compounds	8.05E-05	1.00E-03	2.45E-04	1.3E-03	0.0294	0.26	0.05	0.34	1.7E-4
7440-22-4	Silver and Compounds	4.57E-05	1.01E-04	2.46E-05	1.7E-04	0.0167	0.03	0.01	0.05	2.4E-5
7631-86-9	Silica, crystalline (respirable)	1.18E+00	1.28E+01	4.36E+00	1.8E+01	431.89	3330.35	966.02	4,728.26	2.36
Dust TAC Total		1.19	12.87	4.38	18.44	433.76	3,346.15	969.30	4,749.21	2.37

[2] *Process Area activities using ore EF; Borrow activities using waste EF*

Conversions

2,000 lb/ton

Arsenic and compounds sample calculation for BC

$$\frac{142.61 \text{ lb As}}{1E{+}06 \text{ lb PM}} \times \frac{7.01 \text{ ton PM}}{\text{yr}} \times \frac{2{,}000 \text{ lb}}{\text{ton}} = \frac{2.00 \text{ lb As}}{\text{yr}}$$

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FUGITIVE DUST EMISSIONS - CONTINUED

Activity Information

Total Ore	297,840 ton/yr	Total Borrow	247,000 ton/yr	CEM3/4	249,000 ton/yr

CAS No.	Pollutant	CEM3 lb/day	CEM4 lb/day	Total lb/day	CEM3 lb/yr	CEM4 lb/yr	Total lb/yr		
7440-38-2	Arsenic and compounds	1.11E-3	7.70E-4	1.88E-3	0.25	0.17	0.42	chk	chk
7440-39-3	Barium and compounds	5.72E-3	3.98E-3	0.01	1.27	0.88	2.15	chk	chk
7440-41-7	Beryllium and compounds	1.42E-5	9.88E-6	2.41E-5	3.14E-3	2.19E-3	5.33E-3	chk	chk
7440-43-9	Cadmium and compounds	1.63E-6	1.13E-6	2.76E-6	3.61E-4	2.51E-4	6.12E-4	chk	chk
7440-48-4	Cobalt and compounds	2.16E-5	1.50E-5	3.66E-5	4.78E-3	3.32E-3	8.10E-3	chk	chk
18540-29-9	Chromium VI, chromate, and dichromate particulate	1.79E-4	1.25E-4	3.04E-4	0.04	0.03	0.07	chk	chk
7440-50-8	Copper and compounds	7.67E-5	5.34E-5	1.30E-4	0.02	0.01	0.03	chk	chk
7439-97-6	Mercury and compounds	1.89E-5	1.31E-5	3.20E-5	4.17E-3	2.90E-3	7.08E-3	chk	chk
7439-96-5	Manganese and compounds	7.58E-4	5.28E-4	1.29E-3	0.17	0.12	0.28	chk	chk
1313-27-5	Molybdenum trioxide	5.19E-5	3.61E-5	8.81E-5	0.01	8.00E-3	0.02	chk	chk
C365	Nickel compounds, insoluble	3.50E-5	2.44E-5	5.94E-5	7.75E-3	5.39E-3	0.01	chk	chk
7439-92-1	Lead and compounds	6.46E-5	4.49E-5	1.10E-4	0.01	0.01	0.02	chk	chk
7440-36-0	Antimony and compounds	3.77E-4	2.62E-4	6.39E-4	0.08	0.06	0.14	chk	chk
7440-62-2	Vanadium (fume or dust)	1.58E-4	1.10E-4	2.69E-4	0.04	0.02	0.06	chk	chk
7440-66-6	Zinc and compounds	1.44E-4	1.00E-4	2.45E-4	0.03	0.02	0.05	chk	chk
7440-22-4	Silver and compounds	1.45E-5	1.01E-5	2.46E-5	3.21E-3	2.24E-3	5.45E-3	chk	chk
7631-86-9	Silica, crystalline (respirable)	2.36	2.00	4.36	522.60	443.42	966.02	chk	chk
Dust TAC Total		2.37	2.01	4.38	524.54	444.76	969.30	chk	chk

REFINERY PARTICULATE SOURCES

Activity Information

Source ID	Control Devices	PM ton/day	PM ton/yr	PM10 ton/day	PM10 ton/yr
CKD	Wet Scrubber / Carbon Filter	7.20E-4	0.26	7.20E-4	0.26
MF	Baghouse / Carbon Filter	4.92E-3	0.26	4.92E-3	0.26
Refinery Subtotal		5.64E-3	0.52	5.64E-3	0.52

See Process Sheet

Refinery Particulate TAC Concentrations[1] and Emissions

CAS No.	Pollutant	Ore lb/ton PM	CKD lb/day	CKD lb/yr	MF lb/day	MF lb/yr	Total lb/yr	Total ton/yr
7440-38-2	Arsenic and compounds	0.3084	2.2E-4	8.1E-2	1.52E-03	7.9E-2	1.6E-1	8.0E-5
7440-39-3	Barium and compounds	1.3229	9.5E-4	3.5E-1	6.50E-03	3.4E-1	6.9E-1	3.4E-4
7440-41-7	Beryllium and compounds	0.0022	1.6E-6	5.7E-4	1.07E-05	5.6E-4	1.1E-3	5.7E-7
7440-43-9	Cadmium and compounds	0.0004	2.9E-7	1.1E-4	1.97E-06	1.0E-4	2.1E-4	1.0E-7
7440-48-4	Cobalt and compounds	0.0028	2.0E-6	7.5E-4	1.40E-05	7.3E-4	1.5E-3	7.4E-7
18540-29-9	Chromium VI, chromate, and dichromate p	0.0557	4.0E-5	1.5E-2	2.74E-04	1.4E-2	2.9E-2	1.4E-5
7440-50-8	Copper and compounds	0.0356	2.6E-5	9.4E-3	1.75E-04	9.1E-3	1.8E-2	9.2E-6
7439-96-5	Manganese and compounds	0.1517	1.1E-4	4.0E-2	7.46E-04	3.9E-2	7.9E-2	3.9E-5
1313-27-5	Molybdenum trioxide	0.0176	1.3E-5	4.6E-3	8.64E-05	4.5E-3	9.1E-3	4.6E-6
C365	Nickel compounds, insoluble	0.0092	6.7E-6	2.4E-3	4.54E-05	2.4E-3	4.8E-3	2.4E-6
7439-92-1	Lead and compounds	0.0129	9.3E-6	3.4E-3	6.34E-05	3.3E-3	6.7E-3	3.3E-6
7440-36-0	Antimony and compounds	0.0829	6.0E-5	2.2E-2	4.07E-04	2.1E-2	4.3E-2	2.1E-5
7440-62-2	Vanadium (fume or dust)	0.0321	2.3E-5	8.4E-3	1.58E-04	8.2E-3	1.7E-2	8.3E-6
7440-66-6	Zinc and compounds	0.0329	2.4E-5	8.6E-3	1.62E-04	8.4E-3	1.7E-2	8.5E-6
7440-22-4	Silver and compounds	0.0187	1.3E-5	4.9E-3	9.18E-05	4.8E-3	9.7E-3	4.8E-6
7631-86-9	Silica, crystalline (respirable)	1,272	9.2E-1	3.3E+2	6.25E+00	3.3E+2	6.6E+2	3.3E-1
Refinery Particulate TAC Total			0.92	334.83	6.26	325.71	660.54	0.33

[1] *(Billings 2020)*

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40 CFR 63 SUBPART 7E MERCURY SOURCES

Mercury Emissions

Source ID	Control Devices In Series	Subpart 7E Hg Emissions ton/yr	% of Subpart 7E for Controlled Systems* %	Potential Hours hr/yr	Nominal Hours* hr/yr	Controlled Hg Emissions* lb/hr	lb/yr	ton/yr
CKD	Wet Scrubber / Carbon Filter			8,760	4,000	0.00052	2.08	1.04E-3
EW	Carbon Filter			8,760	4,000	0.00126	5.05	2.53E-3
MR	Condenser / Carbon Filter			8,760	1,200	0.00020	0.23	1.17E-4
MF	Baghouse / Carbon Filter			780	600	0.00173	1.04	5.18E-4
		0.0084	50%				8.40	4.20E-3
Total Refinery Sources (Kiln, EW, Retort, Furnace)		0.008				0.00370	8.40	4.20E-3

**Based on Similar Source Hg Reporting Levels - 2017 Hg Report provided below*

Subpart 7E Limit - Carbon Processes with Mercury Retorts

$$\frac{0.8 \text{ lb Hg}}{\sout{\text{ton}}} \times \frac{21 \sout{\text{ton}}}{\text{yr}} = \frac{16.8 \text{ lb Hg}}{\text{yr}}$$

Similar Source Hg Reporting Levels - 2017 Hg Report

Mine	Hg lb/yr	Conc ton/yr	Hg lb/ton	Hg Limit ton	Limit Part %
Cortez Hills	1.74	47.40	0.0367	0.8	4.6%
Rawhide Mine	0.32	35.40	0.0089	0.8	1.1%
Gold Hill Mine	0.16	16.90	0.0094	0.8	1.2%
Borealis Mining Company	0.002	0.94	0.0022	0.8	0.3%

(NDEP 2017.06)

Similar Source Hg Reporting Levels by Unit - 2017 Hg Report

Mine	Conc ton/yr	Kiln lb/yr	EW Cells lb/yr	Furnace lb/yr	Retort lb/yr	Kiln % total	EW Cells % total	Furnace % total	Retort % total
Cortez Hills	47.40	0.2107	1.4837	0.0026	0.0410	12%	85%	0.1%	2%
Rawhide Mine	35.40	0.0548	0.1202	0.1327	0.0091	17%	38%	42%	3%
Gold Hill Mine	16.90	0.0272	0.1260	0.0040	0.0019	17%	79%	3%	1%
Borealis Mining Company	0.94	0.0011	0.0008	0.0001	0.0001	52%	38%	5%	5%
% Total Hg						25%	60%	12%	3%

(NDEP 2017.06)

Conversions

2,000 lb/ton

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CEMENT AND LIME SILOS

Source Data

Source ID	Description	Production ton/day	Production ton/yr	PM10 ton/day	PM10 ton/yr
CEM1-CEM2	Cement Silo Filling	160	37,484	2.72E-5	6.37E-3
CEM5	Central Mix	85	18,742	2.33E-4	0.05

Cement Silo Emission Factors*

Pollutant	Cement Silo Filling with Fabric Filter lb/ton	Cement Supplement Silo Fillingc lb/ton	Central Mix with Fabric Filter lb/ton	
Arsenic	4.24E-9	1.00E-6	2.96E-7	
Beryllium	4.86E-10	9.04E-8	0.00E+0	
Cadmium	4.68E-9	1.98E-10	7.10E-10	
Chromium	2.90E-8	1.22E-6	1.27E-7	
Lead	1.09E-8	5.20E-7	3.66E-8	
Manganese	1.17E-7	2.56E-7	3.78E-6	
Nickel	4.18E-8	2.28E-6	2.48E-7	
Phosphorus	2.36E-7	3.54E-6	1.60E-6	
Selenium	0.00E+0	7.24E-8	0.00E+0	
Silica, crystalline (respirable)	2.0%	2.0%	2.0%	*(Mintek Resources, 2019); (Lhoist, 2020)*

**AP-42, Table 11.12-8 (6/06) Concrete Batching. Additive is considered equivalent to supplement.*

Cement = 491 *lbs/batch*

Supplement = 79 *lbs/batch*

Cement Silo Emissions

CAS No.	Pollutant	Cement Silo Filling lb/day	Cement Silo Filling lb/yr	Cement Supplement lb/day	Cement Supplement lb/yr	Central Mix lb/day	Central Mix lb/yr	Total lb/day	Total ton/yr
7440-38-2	Arsenic and compounds	5.84E-7	1.37E-4	2.22E-5	5.20E-3	2.51E-5	5.55E-3	4.79E-5	5.44E-6
7440-41-7	Beryllium and compounds	6.70E-8	1.57E-5	2.00E-6	4.70E-4	0.00E+0	0.00E+0	2.07E-6	2.43E-7
7440-43-9	Cadmium and compounds	6.45E-7	1.51E-4	4.39E-9	1.03E-6	6.03E-8	1.33E-5	7.10E-7	8.27E-8
18540-29-9	Chromium VI, chromate, and dichromate particulate	4.00E-6	9.36E-4	2.71E-5	6.34E-3	1.08E-5	2.38E-3	4.18E-5	4.83E-6
7439-92-1	Lead and compounds	1.50E-6	3.52E-4	1.15E-5	2.70E-3	3.11E-6	6.86E-4	1.61E-5	1.87E-6
7439-96-5	Manganese and compounds	1.61E-5	3.78E-3	5.68E-6	1.33E-3	3.21E-4	7.08E-02	3.43E-4	3.80E-5
C365	Nickel compounds, insoluble	5.76E-6	1.35E-3	5.06E-5	1.18E-02	2.11E-5	4.65E-3	7.74E-5	8.92E-6
12185-10-3	Phosphorus, white	3.25E-5	7.62E-3	7.85E-5	1.84E-02	1.36E-4	3.00E-02	2.47E-4	2.80E-5
7782-49-2	Selenium and compounds	0.00E+0	0.00E+0	1.61E-6	3.76E-4	0.00E+0	0.00E+0	1.61E-6	1.88E-7
7631-86-9	Silica, crystalline (respirable)	9.37E-4	2.20E-01	1.51E-4	3.53E-02	1.09E-3	2.55E-01	2.18E-3	2.55E-4
Total TAC		9.98E-4	2.34E-01	3.50E-4	8.20E-02	1.60E-3	3.69E-01	2.95E-3	3.42E-4

Source Data

Source ID	Description	PM10 lb/day	PM10 lb/yr
LS1	Lime Silo Loading	9.35E-6	5.58E-5
LS2	Lime Silo Unloading to Lime Slaker	1.26E-6	4.60E-4

Lime	2 % Silica

(Mintek Resources, 2019); (Lhoist, 2020)

Lime Silo Emissions

CAS No.	Pollutant	Lime Silo Loading lb/day	Lime Silo Loading lb/yr	Lime Silo Unloading lb/day	Lime Silo Unloading lb/yr	Total lb/day	Total ton/yr
7631-86-9	Silica, crystalline (respirable)	1.87E-7	1.12E-6	2.52E-8	9.20E-6	2.12E-7	5.16E-9

Conversions

2,000 lb/ton

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TAC - Fugitive Dust Sources

Activity Information

By Activity	UG/AG	PM lb/day	PM ton/day	PM ton/yr	PM10 lb/day	PM10 ton/day	PM10 ton/yr	
Underground Drilling	UG	0.24	1.18E-04	0.02	0.11	5.60E-05	1.16E-02	*See Mine Sheet*
Borrow Drilling	AG	6.50	3.25E-03	0.85	3.38	1.69E-03	4.39E-01	*See Mine Sheet*
Underground Blasting	UG	0.91	4.56E-04	0.09	0.47	2.37E-04	4.93E-02	*See Mine Sheet*
Borrow Blasting	AG	4.95	2.47E-03	0.06	2.57	1.29E-03	3.35E-02	*See Mine Sheet*
Material Load / Unload	AG	0.77	3.83E-04	0.09	0.36	1.81E-04	4.35E-02	*See Mine Sheet*
Material Load / Unload UG	UG	0.29	1.47E-04	0.03	0.14	6.97E-05	1.45E-02	*See Mine Sheet*
Wind Erosion	AG	4.02	2.01E-03	0.52	2.01	1.01E-03	2.62E-01	*See Mine Sheet*
Ore/Waste Subtotal		17.68	0.0088	1.67	9.05	0.0045	0.85	
		chk	chk	chk	chk	chk	chk	

PM2.5 Ore and Rock	63.6	% Silica

(Ausenco 2020)

Ore and Waste Dust TAC Concentrations and Emissions

CAS No.	Pollutant	Ore ppm	Waste ppm	Ore lb/ton	Waste lb/ton	UFD[1] lb/day	AFD[2] lb/day	UFD[1] lb/yr	AFD[2] lb/yr	Total ton/yr
7440-38-2	Arsenic and compounds	154.21	142.61	0.3084	0.29	2.21E-04	2.34E-03	0.046	0.44	2.4E-04
7440-39-3	Barium and compounds	661.43	736.47	1.32286	1.5E+0	9.65E-04	1.18E-02	0.201	2.199	1.2E-03
7440-41-7	Beryllium and compounds	1.09	1.83	0.00218	3.7E-3	1.68E-06	2.79E-05	3.5E-04	0.005	2.7E-06
7440-43-9	Cadmium and compounds	0.2	0.21	0.0004	4.2E-4	2.90E-07	3.39E-06	6.0E-05	6.3E-04	3.5E-07
7440-48-4	Cobalt and compounds	1.42	2.78	0.00284	0.0056	2.25E-06	4.19E-05	4.7E-04	0.01	4.1E-06
18540-29-9	Chromium VI, chromate, and c	27.87	23.07	0.05574	0.046	3.95E-05	3.86E-04	0.008	0.07	4.1E-05
7440-50-8	Copper and compounds	17.81	9.88	0.03562	0.020	2.45E-05	1.79E-04	0.005	0.04	2.0E-05
7439-97-6	Mercury and compounds	2.24	2.43	0.00448	0.0049	3.26E-06	3.90E-05	6.8E-04	0.01	4.0E-06
7439-96-5	Manganese and compounds	75.84	97.7	0.15168	0.20	1.13E-04	1.53E-03	0.023	0.28	1.5E-04
1313-27-5	Molybdenum trioxide	8.79	6.69	0.01758	0.01	1.24E-05	1.14E-04	2.6E-03	0.02	1.2E-05
C365	Nickel compounds, insoluble	4.62	4.51	0.00924	0.0090	6.65E-06	7.35E-05	1.4E-03	0.01	7.6E-06
7439-92-1	Lead and compounds	6.45	8.32	0.0129	0.0166	9.58E-06	1.31E-04	2.0E-03	0.02	1.3E-05
7440-36-0	Antimony and compounds	41.44	48.53	0.08288	0.097	6.08E-05	7.71E-04	0.013	0.14	7.8E-05
7440-62-2	Vanadium (fume or dust)	16.05	20.4	0.0321	0.041	2.38E-05	3.21E-04	5.0E-03	0.06	3.2E-05
7440-66-6	Zinc and compounds	16.44	18.6	0.03288	0.037	2.40E-05	2.97E-04	5.0E-03	0.06	3.0E-05
7440-22-4	Silver and compounds	9.34	1.87	0.02	0.004	1.24E-05	4.83E-05	2.6E-03	0.01	6.4E-06
7631-86-9	Silica, crystalline (respirable)	636,000	636,000	1,272	1,272	4.61E-01	5.30	96	990	5.43E-01
Fugitive Dust TAC Total						4.63E-01	5.31	96	993	5.45E-01

[1] *Underground activities using ore EF, material load/unload split between ore and waste*

[2] *Borrow activities using waste EF, material load/unload and wind erosion split between ore and waste*

Conversions

2,000 lb/ton

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TAC - Fugitive Dust Sources - continued

Material Blasted	
UFD	291,200 ton/yr
AFD	247,000 ton/yr

Ore and Waste Dust TAC Concentrations and Emissions

CAS No.	Pollutant	Ore ppm	Waste ppm	Ore lb/ton	Waste lb/ton	UG[1] lb/yr	AG[2] lb/yr	Adjusted EF UFD lb/ton	Adjusted EF AFD lb/ton
7440-38-2	Arsenic and compounds	154.21	142.61	0.3084	0.29	0.046	0.442	2E-07	2E-06
7440-39-3	Barium and compounds	661.43	736.47	1.3229	1.47	0.201	2.199	7E-07	9E-06
7440-41-7	Beryllium and compounds	1.09	1.83	0.0022	0.00	0.000	0.005	1E-09	2E-08
7440-43-9	Cadmium and compounds	0.2	0.21	0.0004	0.00	0.000	0.001	2E-10	3E-09
7440-48-4	Cobalt and compounds	1.42	2.78	0.0028	0.01	0.000	0.008	2E-09	3E-08
18540-29-9	Chromium VI, chromate, and dichrom	27.87	23.07	0.0557	0.05	0.008	0.073	3E-08	3E-07
7440-50-8	Copper and compounds	17.81	9.88	0.0356	0.02	0.005	0.035	2E-08	1E-07
7439-97-6	Mercury and compounds	2.24	2.43	0.0045	0.00	0.001	0.007	2E-09	3E-08
7439-96-5	Manganese and compounds	75.84	97.7	0.1517	0.20	0.023	0.284	8E-08	1E-06
1313-27-5	Molybdenum trioxide	8.79	6.69	0.0176	0.01	0.003	0.022	9E-09	9E-08
C365	Nickel compounds, insoluble	4.62	4.51	0.0092	0.01	0.001	0.014	5E-09	6E-08
7439-92-1	Lead and compounds	6.45	8.32	0.0129	0.02	0.002	0.024	7E-09	1E-07
7440-36-0	Antimony and compounds	41.44	48.53	0.0829	0.10	0.013	0.144	4E-08	6E-07
7440-62-2	Vanadium (fume or dust)	16.05	20.4	0.0321	0.04	0.005	0.060	2E-08	2E-07
7440-66-6	Zinc and compounds	16.44	18.6	0.0329	0.04	0.005	0.055	2E-08	2E-07
7440-22-4	Silver and compounds	9.34	1.87	0.0187	0.00	0.003	0.010	9E-09	4E-08
7631-86-9	Silica, crystalline (respirable)	636,000	636,000	1,272	1,272	95.94	989.52	3E-04	4E-03
Dust TAC Total									

(1) *Underground activities using ore EF, material load/unload split between ore and waste*

(2) *Borrow activities using waste EF, material load/unload and wind erosion split between ore and waste*

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TAC - Blasting Material

Activity Information

ANFO/emulsion use

529 ton emulsion/yr, underground
68 ton ANFO/yr, borrow
208 day/yr, underground
260 day/yr, borrow

Diesel content of ANFO/emulsion

Based on: *6% diesel content in ANFO (NIOSH n.d.)*
7.05 lb/gal distillate oil
0.137 MMBtu/gal

1,234 emulsion diesel MMBtu/yr
159 ANFO diesel MMBtu/yr

Blasting Material TAC Emissions

CAS No.	Pollutant, VOCs	Emission Factor mg/kg [1]	Emission Factor lb/ton	Emulsion TACs [3] lb/day	Emulsion TACs [3] lb/yr	ANFO TACs lb/day	ANFO TACs lb/yr
115-07-1	Propylene	1.40E+01	2.80E-02	7.12E-02	14.81	7.35E-03	1.91
106-99-0	1,3-Butadiene	7.60E-01	1.52E-03	3.87E-03	0.80	3.99E-04	0.10
75-05-8	Acetonitrile	1.00E+01	2.00E-02	5.09E-02	10.58	5.25E-03	1.37
107-02-8	Acrolein	1.00E+00	2.00E-03	5.09E-03	1.06	5.25E-04	0.14
67-64-1	Acetone	6.80E-01	1.36E-03	3.46E-03	0.72	3.57E-04	0.09
67-63-0	Isopropyl alcohol	1.30E+00	2.60E-03	6.61E-03	1.38	6.83E-04	0.18
107-13-1	Acrylonitrile	1.90E+00	3.80E-03	9.66E-03	2.01	9.98E-04	0.26
71-43-2	Benzene	1.20E+01	2.40E-02	6.10E-02	12.70	6.30E-03	1.64
108-88-3	Toluene	1.80E+00	3.60E-03	9.16E-03	1.90	9.45E-04	0.25
100-41-4	Ethyl benzene	1.20E-01	2.40E-04	6.10E-04	0.13	6.30E-05	0.02
100-42-5	Styrene	9.00E-01	1.80E-03	4.58E-03	0.95	4.73E-04	0.12
108-67-8	1,3,5-Trimethylbenzene	2.80E-01	5.60E-04	1.42E-03	0.30	1.47E-04	0.04
91-20-3	Naphthalene	1.90E+00	3.80E-03	9.66E-03	2.01	9.98E-04	0.26

CAS No.	Pollutant, Metals	Emission Factor lb/MMBtu [2]	Emulsion TACs lb/day	Emulsion TACs lb/yr	ANFO TACs lb/day	ANFO TACs lb/yr
7440-38-2	Arsenic and compounds	4.00E-06	2.37E-05	0.005	2.45E-06	0.0006
7440-41-7	Beryllium and compounds	3.00E-06	1.78E-05	0.004	1.84E-06	0.0005
7440-43-9	Cadmium and compounds	3.00E-06	1.78E-05	0.004	1.84E-06	0.0005
+ 18540-29-9	Chromium VI, chromate, and dichromate particu	3.00E-06	1.78E-05	0.004	1.84E-06	0.0005
7440-50-8	Copper and compounds	6.00E-06	3.56E-05	0.007	3.67E-06	0.0010
7439-92-1	Lead and compounds	9.00E-06	5.34E-05	0.011	5.51E-06	0.0014
7439-97-6	Mercury and compounds	3.00E-06	1.78E-05	0.004	1.84E-06	0.0005
7439-96-5	Manganese and compounds	6.00E-06	3.56E-05	0.007	3.67E-06	0.0010
C365	Nickel compounds, insoluble	3.00E-06	1.78E-05	0.004	1.84E-06	0.0005
7782-49-2	Selenium and compounds	1.50E-05	8.90E-05	0.019	9.18E-06	0.0024
7440-66-6	Zinc and compounds	4.00E-06	2.37E-05	0.005	2.45E-06	0.0006
Blasting Material TAC Total			0.24	49.4	0.025	6.4

[1] *Emission factors for VOCs based on (EPA 2016a)*

[2] *Emission factors for metals based on (EPA 1995) Table 1.3-10*

[3] *Emulsion material TAC emissions calculated assuming 100% ANFO content.*

\+ *All Cr assumed to be Cr IV*

Conversions

1.00E+06 mg/kg
2.205 lb/kg
907.186 kg/ton
2,000 lb/ton

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Greenhouse Gas Emissions - Combustion Sources

Activity Information	chk		
Mining Mobile Equipment		Underground	
Total Diesel Machinery	164,132 gal/yr	22,486 MMBtu/yr[1]	

[1] Based on diesel heating value of 137,000 Btu/gal *AP-42, Appendix A, p. A-5, 9/85*

TAC Emissions - Diesel Combustion

Greenhouse Gas Emission Factors[1] and Emissions

	Global Warming Potential[2]	**Emission Factor** kg/MMBtu	**Emissions** mt/yr	**Emissions CO2e** ton/yr
CO2	1	73.96	1,663	1833
CH4	25	3.0E-3	0.067	1.86
N2O	298	6.0E-4	0.013	4.43
Combustion Total GHG			1,663	1,840

[1] *40 CFR 98 Tab. C-1 and C-2 (Caterpillar 2018)*

[2] *40 CFR 98 Tab. A-1 (Caterpillar 2018)*

Conversions
2,000 lb/ton
1,000 kg/mt
907.19 kg/ton

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Hazardous Air Pollutants - Combustion Sources

	Diesel	
Category	gal/yr	MMBtu/yr
Underground	164,132	22,486

Underground schedule	208 day/yr

TAC Emissions - Diesel Combustion

		Emission Factor		UDP	
CAS	**Pollutant**	**lb/MMBtu**	**lb/day**	**lb/yr**	**ton/yr**
106-99-0	1,3-Butadiene	1.59E-3	1.72E-1	3.57E+1	1.78E-2
83-32-9	Acenaphthene	2.45E-5	2.64E-3	5.50E-1	2.75E-4
208-96-8	Acenaphthylene	2.97E-5	3.21E-3	6.67E-1	3.34E-4
75-07-0	Acetaldehyde	5.72E-3	6.18E-1	1.29E+2	6.43E-2
107-02-8	Acrolein	2.47E-4	2.68E-2	5.56E+0	2.78E-3
7664-41-7	Ammonia	2.12E-2	2.29E+0	4.76E+2	2.38E-1
120-12-7	Anthracene	2.93E-5	3.17E-3	6.59E-1	3.30E-4
7440-38-2	Arsenic and compounds	1.17E-5	1.26E-3	2.63E-1	1.31E-4
71-43-2	Benzene	1.36E-3	1.47E-1	3.06E+1	1.53E-2
56-55-3	Benz[a]anthracene	2.85E-5	3.08E-3	6.41E-1	3.20E-4
50-32-8	Benzo[a]pyrene	2.59E-7	2.80E-5	5.83E-3	2.91E-6
205-99-2	Benzo[b]fluoranthene	4.89E-5	5.29E-3	1.10E+0	5.50E-4
191-24-2	Benzo[g,h,i]perylene	2.08E-8	2.25E-6	4.68E-4	2.34E-7
207-08-9	Benzo[k]fluoranthene	4.89E-5	5.29E-3	1.10E+0	5.50E-4
7440-43-9	Cadmium and compounds	1.09E-5	1.18E-3	2.46E-1	1.23E-4
108-90-7	Chlorobenzene	1.46E-6	1.58E-4	3.28E-2	1.64E-5
218-01-9	Chrysene	2.61E-5	2.82E-3	5.87E-1	2.94E-4
7440-50-8	Copper and compounds	2.99E-5	3.24E-3	6.73E-1	3.36E-4
53-70-3	Dibenz[a,h]anthracene	2.55E-5	2.76E-3	5.73E-1	2.87E-4
100-41-4	Ethyl benzene	7.96E-5	8.60E-3	1.79E+0	8.95E-4
206-44-0	Fluoranthene	2.92E-5	3.15E-3	6.56E-1	3.28E-4
86-73-7	Fluorene	1.54E-4	1.67E-2	3.47E+0	1.73E-3
50-00-0	Formaldehyde	1.26E-2	1.36E+0	2.83E+2	1.42E-1
110-54-3	Hexane	1.96E-4	2.12E-2	4.42E+0	2.21E-3
7647-01-0	Hydrochloric Acid	1.36E-3	1.47E-1	3.06E+1	1.53E-2
18540-29-9	Chromium VI, chromate, and dich	7.30E-7	7.89E-5	1.64E-2	8.21E-6
193-39-5	Indeno[1,2,3-cd]pyrene	2.53E-5	2.73E-3	5.68E-1	2.84E-4
7439-92-1	Lead and compounds	6.06E-5	6.55E-3	1.36E+0	6.81E-4
7439-96-5	Manganese and compounds	2.26E-5	2.45E-3	5.09E-1	2.54E-4
7439-97-6	Mercury and compounds	1.46E-5	1.58E-3	3.28E-1	1.64E-4
91-20-3	Naphthalene	1.44E-4	1.55E-2	3.23E+0	1.62E-3
C365	Nickel compounds, insoluble	2.85E-5	3.08E-3	6.40E-1	3.20E-4
85-01-8	Phenanthrene	2.85E-4	3.08E-2	6.40E+0	3.20E-3
115-07-1	Propylene	3.41E-3	3.69E-1	7.66E+1	3.83E-2
129-00-0	Pyrene	6.15E-5	6.65E-3	1.38E+0	6.91E-4
7782-49-2	Selenium and compounds	1.61E-5	1.74E-3	3.61E-1	1.81E-4
108-88-3	Toluene	7.69E-4	8.32E-2	1.73E+1	8.65E-3
1330-20-7	Xylene (mixture), including m-xyl	3.09E-3	3.35E-1	6.96E+1	3.48E-2
7440-66-6	Zinc and compounds	1.64E-4	1.77E-2	3.68E+0	1.84E-3
C200	Diesel Particulate Matter	2.45E-1	26.43	5,498.4	2.75
Total TACs			32	6,688	3.34

Based on heating value of *0.137 MMBtu/gal*

Formaldehyde sample calculation

$$\frac{1.7261\ \text{lb}}{1000\ \text{gal}} \times \frac{\text{gal}}{0.137\ \text{MMBtu}} \times \frac{22{,}486.0\ \text{MMBtu}}{\text{yr}} \times \frac{\text{ton}}{2{,}000\ \text{lb}} = \frac{1.42\text{E-}01\ \text{ton}}{\text{yr}}$$

Conversions

2,000 lb/ton

1,000 kg/mt

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: M. Mavko
	PROJECT NO: 343-1	PAGE: 3 OF: 3 SHEET: NonroadTAC
AIR EMISSION CALCULATIONS	SUBJECT: Nonroad TAC and GHG Emissions	DATE: June 30, 2022

Hazardous Air Pollutants - Combustion Sources - Emission Factor Calculations

TAC	CATEF[1] lbs/Mgal ICE	VCAPCD[2] lbs/Mgal ICE	SCAQMD[3] lbs/Mgal ICE	ODEQ[4] lbs/Mgal	Final ODEQ or Max
1,3-Butadiene	5.41E-3	2.17E-1	2.17E-1	2.17E-1	2.17E-1
Acenaphthene	3.35E-3				3.35E-3
Acenaphthylene	4.07E-3				4.07E-3
Acetaldehyde	1.07E-1	7.83E-1	7.83E-1	7.83E-1	7.83E-1
Acrolein	1.30E-2	3.39E-2	3.39E-2	3.39E-2	3.39E-2
Ammonia	4.85E+0		2.90E+0	2.90E+0	2.90E+0
Anthracene	4.02E-3				4.02E-3
Arsenic and compounds		1.60E-3	1.60E-3	1.60E-3	1.60E-3
Benzaldehyde	1.26E-2				1.26E-2
Benzene	2.85E-1	1.86E-1	1.86E-1	1.86E-1	1.86E-1
Benz[a]anthracene	3.90E-3				3.90E-3
Benzo[a]pyrene	3.35E-3			3.55E-5	3.55E-5
Benzo[b]fluoranthene	6.70E-3				6.70E-3
Benzo[g,h,i]perylene	2.85E-6				2.85E-6
Benzo[g,h,i]perylene	3.52E-3				3.52E-3
Benzo[k]fluoranthene	6.70E-3				6.70E-3
Cadmium and compounds		1.50E-3	1.50E-3	1.50E-3	1.50E-3
Chlorobenzene		2.00E-4			2.00E-4
Chrysene	3.58E-3				3.58E-3
Copper and compounds		4.10E-3	4.10E-3	4.10E-3	4.10E-3
Dibenz[a,h]anthracene	3.49E-3				3.49E-3
Ethyl benzene	6.76E-3	1.09E-2	1.09E-2	1.09E-2	1.09E-2
Fluoranthene	4.00E-3				4.00E-3
Fluorene	2.11E-2				2.11E-2
Formaldehyde	1.11E+0	1.73E+0	1.73E+0	1.73E+0	1.73E+0
Hexane	1.39E-3	2.69E-2	2.69E-2	2.69E-2	2.69E-2
Chromium VI, chromate, and dichromate part		1.00E-4	1.00E-4	1.00E-4	1.00E-4
Hydrochloric Acid		1.86E-1	1.86E-1	1.86E-1	1.86E-1
Indeno[1,2,3-cd]pyrene	3.46E-3				3.46E-3
Lead and compounds		8.30E-3	8.30E-3	8.30E-3	8.30E-3
Manganese and compounds		3.10E-3	3.10E-3	3.10E-3	3.10E-3
Mercury and compounds		2.00E-3	2.00E-3	2.00E-3	2.00E-3
Naphthalene	5.64E-2	1.97E-2	1.97E-2	1.97E-2	1.97E-2
Nickel compounds, insoluble		3.90E-3	3.90E-3	3.90E-3	3.90E-3
Phenanthrene	3.90E-2				3.90E-2
Propylene	3.85E-1	4.67E-1			4.67E-1
Pyrene	8.42E-3				8.42E-3
Selenium and compounds		2.20E-3	2.20E-3	2.20E-3	2.20E-3
Toluene	8.50E-2	1.05E-1	1.05E-1	1.05E-1	1.05E-1
total chromium		6.00E-4			6.00E-4
Xylene (mixture), including m-x	3.59E-2	4.24E-2	4.24E-2	4.24E-1	4.24E-1
Zinc and compounds		2.24E-2			2.24E-2
Polycyclic aromatic hydrocarbons (PAHs)				3.62E-2	3.62E-2
Diesel Particulate Matter				33.5	33.5

(1) *(CARB 2000)*

(2) *(VCAPCD 2001)*

(3) *(AQMD 2020)*

(4) *(ODEQ 2020)*

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: M. Mavko
	PROJECT NO: 343-1	PAGE: 1 OF: 7 SHEET: Tanks
AIR EMISSION CALCULATIONS	SUBJECT: Tank Emission Calculations	DATE: June 30, 2022

Fuel Storage Tanks

TEU	Storage Tank	Capacity gal	Dimensions Diameter ft	Dimensions Length ft	Throughput gal/yr	Configuration	VOC Emissions* lb/yr	VOC Emissions* ton/yr	Reference
TG1	Mine Site Gasoline Tank #1	10,000	9.5	19	120,000	Horizontal	1852.3	0.93	*Based on 1 turnover/month*
TD1	Mine Site Diesel Tank #1	30,000	18	18	240,000	Vertical	8.18	0.0041	*(Dyer 2019.03.21)*
TD2	Mine Site Diesel Tank #2	3,000	7	14	15,000	Horizontal	0.86	4.3E-4	*(Dyer 2019.03.21)*

**Emissions calculated using EPA Tanks 4.0.9d (EPA 1999a)*

HAP/TAP Emission Factors and Emissions

Operation Schedule 365 day/yr

Gasoline

CAS No.	Pollutant	EPA[1] Conc. wt. %	SCAQMD[2] Conc. wt. %	Final EF Max wt. %	TG1 Emissions lb/day	TG1 Emissions ton/yr
71-43-2	Benzene	1.608%	1.800%	1.800%	0.09	0.017
92-52-4	Biphenyl	0.010%		0.010%	5.07E-04	9.26E-05
110-82-7	Cyclohexane	0.240%	0.240%	0.240%	0.01	0.002
100-41-4	Ethyl benzene	1.605%	1.400%	1.605%	0.08	0.015
110-54-3	Hexane	7.138%	1.000%	7.138%	0.36	0.066
91-20-3	Naphthalene	0.444%		0.444%	0.02	0.004
108-95-2	Phenol	0.055%		0.055%	0.00	0.001
108-88-3	Toluene	7.212%	7.000%	7.212%	0.37	0.067
95-63-6	1,2,4-Trimethylben:	2.500%	2.500%	2.500%	0.13	0.023
1330-20-7	Xylene (mixture), ir	7.170%	7.000%	7.170%	0.36	0.066
98-82-8	Isopropylbenzene (Cumene)		0.500%	0.500%	0.03	0.005
Total					1.46	0.266

Diesel

CAS No.	Pollutant	EPA[1] Conc. wt. %	SCAQMD[2] Max wt. %	CATEF[3] Conc. wt. %	Final EF Max wt. %	TD1 Emissions lb/day	TD1 Emissions ton/yr	TD2 Emissions lb/day	TD2 Emissions ton/yr	Total ton/yr
71-43-2	Benzene	0.001%		0.0001%	0.001%	1.88E-7	3.44E-8	1.98E-8	3.61E-9	3.80E-8
92-52-4	Biphenyl	0.100%			0.100%	2.24E-5	4.09E-6	2.36E-6	4.30E-7	4.52E-6
100-41-4	Ethyl benzene	0.013%	0.010%		0.013%	2.91E-6	5.32E-7	3.06E-7	5.59E-8	5.88E-7
110-54-3	Hexane	1.000%			1.000%	2.24E-4	4.09E-5	2.36E-5	4.30E-6	4.52E-5
91-20-3	Naphthalene	0.550%			0.550%	1.23E-4	2.25E-5	1.30E-5	2.37E-6	2.49E-5
85-01-8	Phenanthrene	0.125%			0.125%	2.80E-5	5.11E-6	2.95E-6	5.38E-7	5.65E-6
108-95-2	Phenol	0.064%			0.064%	1.43E-5	2.62E-6	1.51E-6	2.75E-7	2.89E-6
100-42-5	Styrene	0.032%			0.032%	7.17E-6	1.31E-6	7.54E-7	1.38E-7	1.45E-6
108-88-3	Toluene	0.032%	0.030%	0.00004%	0.032%	7.17E-6	1.31E-6	7.54E-7	1.38E-7	1.45E-6
95-63-6	1,2,4-Trimethylben:	1.000%	1.000%		1.000%	2.24E-4	4.09E-5	2.36E-5	4.30E-6	4.52E-5
1330-20-7	Xylene (mixture), ir	0.290%	0.290%	0.0003%	0.290%	6.50E-5	1.19E-5	6.83E-6	1.25E-6	1.31E-5
7440-38-2	Arsenic and compo	not volatile			0%	0.0	0.0	0.0	0.0	0.0
7440-41-7	Beryllium and com	not volatile			0%	0.0	0.0	0.0	0.0	0.0
7440-43-9	Cadmium and com	not volatile			0%	0.0	0.0	0.0	0.0	0.0
18540-29-	Chromium VI, chrc	not volatile			0%	0.0	0.0	0.0	0.0	0.0
7440-50-8	Copper and compo	not volatile			0%	0.0	0.0	0.0	0.0	0.0
7439-96-5	Manganese and cor	not volatile			0%	0.0	0.0	0.0	0.0	0.0
7439-97-6	Mercury and comp	0.00004%			0.00004%	8.96E-9	1.64E-9	9.42E-10	1.72E-10	1.81E-9
C365	Nickel compounds,	not volatile			0%	0.0	0.0	0.0	0.0	0.0
Total						7.19E-4	1.31E-4	7.56E-5	1.38E-5	1.45E-4

[1] *(EPA 1999a)*

[2] *(AQMD 2020)*

[3] *(CARB 2000)*

Conversion

1E-07 %/ppb

2,000 lb/ton

Mine Site Gasoline Tank #1

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification:	TG1	
City:	Malheur County	
State:	Oregon	
Company:	Calico Resources, Inc.	
Type of Tank:	Horizontal Tank	
Description:	Mine Site Gasoline Tank #1	
Tank Dimensions		
Shell Length (ft):		19.00
Diameter (ft):		9.50
Volume (gallons):		10,000.00
Turnovers:		12.00
Net Throughput(gal/yr):		120,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	White/White	
Shell Condition	Good	
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meteorologicalx Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TG1 - Horizontal Tank
Malheur County, Oregon

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	52.81	46.88	58.74	50.94	3.9950	3.5384	4.4980	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

Mine Site Gasoline Tank #1 - continued

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

TG1 - Horizontal Tank
Malheur County, Oregon

Annual Emission Calculations	
Standing Losses (lb):	1,087.5463
Vapor Space Volume (cu ft):	857.8099
Vapor Density (lb/cu ft):	0.0487
Vapor Space Expansion Factor:	0.1431
Vented Vapor Saturation Factor:	0.4986
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	857.8099
Tank Diameter (ft):	9.5000
Effective Diameter (ft):	15.1637
Vapor Space Outage (ft):	4.7500
Tank Shell Length (ft):	19.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0487
Vapor Molecular Weight (lb/lb-mole):	67.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.9950
Daily Avg. Liquid Surface Temp. (deg. R):	512.4830
Daily Average Ambient Temp. (deg. F):	50.9208
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	510.6108
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,400.5355
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.1431
Daily Vapor Temperature Range (deg. R):	23.7125
Daily Vapor Pressure Range (psia):	0.9596
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.9950
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	3.5384
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	4.4980
Daily Avg. Liquid Surface Temp. (deg R):	512.4830
Daily Min. Liquid Surface Temp. (deg R):	506.5548
Daily Max. Liquid Surface Temp. (deg R):	518.4111
Daily Ambient Temp. Range (deg. R):	23.6750
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.4986
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	3.9950
Vapor Space Outage (ft):	4.7500
Working Losses (lb):	764.7587
Vapor Molecular Weight (lb/lb-mole):	67.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.9950
Annual Net Throughput (gal/yr.):	120,000.0000
Annual Turnovers:	12.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	9.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	1,852.3049

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

TG1 - Horizontal Tank
Malheur County, Oregon

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 9)	764.76	1,087.55	1,852.30

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: M. Mavko
	PROJECT NO: 343-1	PAGE: 4 OF: 7 SHEET: Tanks
AIR EMISSION CALCULATIONS	SUBJECT: Tank Emission Calculations	DATE: June 30, 2022

Mine Site Diesel Tank #1

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification		
User Identification:	TD1	
City:	Malheur County	
State:	Oregon	
Company:	Calico Resources, Inc.	
Type of Tank:	Vertical Fixed Roof Tank	
Description:	Mine Site Diesel Tank #1	
Tank Dimensions		
Shell Height (ft):		18.00
Diameter (ft):		18.00
Liquid Height (ft) :		15.76
Avg. Liquid Height (ft):		9.00
Volume (gallons):		30,000.00
Turnovers:		8.00
Net Throughput(gal/yr):		240,000.00
Is Tank Heated (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	White/White	
Shell Condition	Good	
Roof Color/Shade:	White/White	
Roof Condition:	Good	
Roof Characteristics		
Type:	Dome	
Height (ft)		1.00
Radius (ft) (Dome Roof)		18.00
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TD1 - Vertical Fixed Roof Tank
Malheur County, Oregon

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	52.81	46.88	58.74	50.94	0.0051	0.0041	0.0062	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065

Mine Site Diesel Tank #1 - continued

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

TD1 - Vertical Fixed Roof Tank
Malheur County, Oregon

Annual Emission Calculations

Standing Losses (lb):	4.4158
Vapor Space Volume (cu ft):	2,417.9791
Vapor Density (lb/cu ft):	0.0001
Vapor Space Expansion Factor:	0.0419
Vented Vapor Saturation Factor:	0.9975
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	2,417.9791
Tank Diameter (ft):	18.0000
Vapor Space Outage (ft):	9.5021
Tank Shell Height (ft):	18.0000
Average Liquid Height (ft):	9.0000
Roof Outage (ft):	0.5021
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.5021
Dome Radius (ft):	18.0000
Shell Radius (ft):	9.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0051
Daily Avg. Liquid Surface Temp. (deg. R):	512.4830
Daily Average Ambient Temp. (deg. F):	50.9208
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	510.6108
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,400.5355
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0419
Daily Vapor Temperature Range (deg. R):	23.7125
Daily Vapor Pressure Range (psia):	0.0022
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0051
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0041
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0062
Daily Avg. Liquid Surface Temp. (deg R):	512.4830
Daily Min. Liquid Surface Temp. (deg R):	506.5548
Daily Max. Liquid Surface Temp. (deg R):	518.4111
Daily Ambient Temp. Range (deg. R):	23.6750
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9975
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0051
Vapor Space Outage (ft):	9.5021
Working Losses (lb):	3.7608
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0051
Annual Net Throughput (gal/yr.):	240,000.0000
Annual Turnovers:	8.0000
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	30,000.0000
Maximum Liquid Height (ft):	15.7599
Tank Diameter (ft):	18.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	8.1766

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual
TD1 - Vertical Fixed Roof Tank
Malheur County, Oregon

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	3.76	4.42	8.18

Mine Site Diesel Tank #2

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification		
User Identification:	TD2	
City:	Malheur County	
State:	Oregon	
Company:	Calico Resources, Inc.	
Type of Tank:	Horizontal Tank	
Description:	Mine Site Diesel Tank #2	
Tank Dimensions		
Shell Length (ft):		14.00
Diameter (ft):		7.00
Volume (gallons):		3,000.00
Turnovers:		5.00
Net Throughput(gal/yr):		15,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	White/White	
Shell Condition	Good	
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TD2 - Horizontal Tank
Malheur County, Oregon

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	52.81	46.88	58.74	50.94	0.0051	0.0041	0.0062	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065

Mine Site Diesel Tank #2 - continued

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

TD2 - Horizontal Tank
Malheur County, Oregon

Annual Emission Calcaulations

Standing Losses (lb):	0.6277
Vapor Space Volume (cu ft):	343.1740
Vapor Density (lb/cu ft):	0.0001
Vapor Space Expansion Factor:	0.0419
Vented Vapor Saturation Factor:	0.9991
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	343.1740
Tank Diameter (ft):	7.0000
Effective Diameter (ft):	11.1732
Vapor Space Outage (ft):	3.5000
Tank Shell Length (ft):	14.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0051
Daily Avg. Liquid Surface Temp. (deg. R):	512.4830
Daily Average Ambient Temp. (deg. F):	50.9208
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	510.6108
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,400.5355
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0419
Daily Vapor Temperature Range (deg. R):	23.7125
Daily Vapor Pressure Range (psia):	0.0022
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0051
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0041
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0062
Daily Avg. Liquid Surface Temp. (deg R):	512.4830
Daily Min. Liquid Surface Temp. (deg R):	506.5548
Daily Max. Liquid Surface Temp. (deg R):	518.4111
Daily Ambient Temp. Range (deg. R):	23.6750
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9991
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0051
Vapor Space Outage (ft):	3.5000
Working Losses (lb):	0.2350
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0051
Annual Net Throughput (gal/yr.):	15,000.0000
Annual Turnovers:	5.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	7.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.8628

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

TD2 - Horizontal Tank
Malheur County, Oregon

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.24	0.63	0.86

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: K. Lewis
	PROJECT NO: 343-1	PAGE: 1 OF: 13 SHEET: HCN Monthly
AIR EMISSION CALCULATIONS	SUBJECT: HCN calculations	DATE: June 30, 2022

Monthly Average 2-meter Temperatures for the Calico Meteorological Station for 2014/10 through 2015/09

		Temperature			HCN	HCN
	Month	(C)	(F)	Month	ton/yr	lb/yr
2014/10	October	12.8	55.0	10	1.928	3,856
2014/11	November	1.41	34.5	11	1.768	3,536
2014/12	December	0.915	33.6	12	1.763	3,525
2015/01	January	-1.32	29.6	1	1.738	3,476
2015/02	February	4.82	40.7	2	1.810	3,620
2015/03	March	8.28	46.9	3	1.857	3,715
2015/04	April	9.33	48.8	4	1.873	3,746
2015/05	May	14.8	58.7	5	1.963	3,927
2015/06	June	23.9	75.1	6	2.152	4,303
2015/07	July	23.6	74.6	7	2.145	4,290
2015/08	August	24.5	76.1	8	2.165	4,331
2015/09	September	17.9	64.3	9	2.022	4,044

(Wolverson 2019.03.25), 2014-2015 onsite meteorological data

Annual Average 2-meter Temperature and 10-m Wind Speed for the Calico Meteorological Station for 2014/10 through 2015/09

	Temperature		Wind Speed	HCN	HCN
Period	(C)	(F)	(m/s)	ton/yr	lb/yr
2014/10 - 2015/09	11.8	53.3	3.2	1.932	3,864

(Wolverson 2019.03.25), 2014-2015 onsite meteorological data

	HCN
	lb/mo
Month	Monthly
1	290
2	302
3	310
4	312
5	327
6	359
7	357
8	**361**
9	337
10	321
11	295
12	294
Total	3,864
ton/yr	1.932

Conversions

2,000 lb/ton

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: K. Lewis
	PROJECT NO: 343-1	PAGE: 2 OF: 13 SHEET: HCN Monthly
AIR EMISSION CALCULATIONS	SUBJECT: HCN calculations	DATE: June 30, 2022

Grassy Mountain HCN Emissions m/s or g/m2-s(1) Wind: m/s Fw

Month: January Snow Cover 0 days w/ 0.5+ in. 0% snow 3.2 1.05

0% ice

Fugitive Emissions

Area	Source	Cat.	Category Description	Acres	Snow Cover Adjustment Acres	pH	Free CN- g/m3(3)	T C	pKa	a0	H	Overall (1) Flux (g/m2-s) or kG (m/s)	Fa*Fw	g/s	lb/yr
TSF	Tailings Storag	TA	Tails, Aqueous Surface	8.03	8.03	8.00	10	-1.32	9.934	0.9885	0.00210	1.89E-5	0.49	0.0062	433.4
		TW	Tails, Wet Sediment	26.37	26.37							5.31E-8	0.49	0.0028	192.9
		TD	Tails, Dry Sediment	53.53	53.53							2.33E-8	1.00	0.0050	350.3
			Active Surface Subtotal	***34.40***											
Mill															
	Tailings Pipelin	TA	Tails, Aqueous Surface	2.502	2.502	8.00	10.00	-1.32	9.934	0.9885	0.00210	1.89E-5	0.57	0.0022	155.9
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CIL Tank 1	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 2	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 3	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 4	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 5	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 6	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 7	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
												Overall			
			TOTAL AREA	**90.50**	**90.50**									***Fugitive Total (lb/yr)***	**3,436**
														Fugitive Total (ton/yr)	**1.72**

Stack Emissions

	lb/hr(2)	hr/yr	lb/yr
EW Cells	0.000567	8,760	**5.0**
Preg/Barren Tanks	0.004	8,760	**35.0**
		Stack Total (lb/yr)	**40.0**
		Stack Total (ton/yr)	**0.02**
		Total (ton/yr)	**1.74**

(1) *Per EPA's request, three gold mines in Nevada conducted fugitive HCN emission measurements in the fourth quarter of 2009 in order to quantify emissions from the various fugitive HCN sources at gold mines. The Quality Assurance Project Plan (QAPP) for this testing, the EPA's approval letter of this QAPP, and the final fugitive HCN test report are provided on the federal docket website athttps://www.regulations.gov/docketBrowser?rpp=25&so=DESC&sb=commentDueDate&po=0&s=EPA-HQ-OAR-2010-0239-0163&dct=SR&D=EPA-HQ-OAR-2010-0239. The IDs for these documents are EPA-HQ-OAR-2010-0239-0102, EPA-HQ-OAR-2010-0239-0103, and EPA-HQ-OAR-2010-0239-0163 (0163.0 through 0163.6), respectively. The above emission factors were taken from the final fugitive HCN test report, "Card and Schmidt. Evaluation of Air Emissions of Hydrogen Cyanide from Fugitive Sources at Nevada Gold Mines Using the USEPA Surface Isolation Flux Chamber Technology. April 2010."*

CSIRO. 2008. "NOx Emissions from Blasting Operations in Open-Cut Coal Mining." Atmospheric Environment. Vol. 42. Elsevier. 7874-7883. Grassy Mountain. Received 06/18/2021. File.

(2) *The emission factor is baes on the average HCN test data from similar facilities (EW cells with carbon control):*

See: http://www.regulations.gov/#!docketDetail;rpp=250;po=0;s=HCN;D=EPA-HQ-OAR-2010-0239
Hydrogen Cyanide (HCN) Stack Test for Cortez November 2009
Hydrogen Cyanide (HCN) Stack Test for Goldstrike September & November 2009
HCN (Hydrogen Cyanide) Stack Test for Round Mountain November 2009
HCN (Hydrogen Cyanide) Stack Test for Gold Quarry July 2009
HCN (Hydrogen Cyanide) Stack Test for Twin Creeks November 2009

Conversion Factors:

453.59	g/lb
4,047	m2/acre
8,760	hr/yr
60	min/hr
3,600	s/hr
43,560	ft2/acre
2,000	lb/ton
1	lb/ton NaCN =
265.41	g/m^3 CN
24	hr/day

(3) **Fugitive Sources - Cyanide Solution**

		Surface Area			Solution Parameters* pH	Concentration		
TSF	Tails, Aqueous Surface	8.03	acre	*(Barton 2019.03.31)*	8	10	g/m^3, free	*(Prestia. 2019.04.18) and EPA-HQ-OAR-2010-0239-0163*
					Using conservative values for permitting			
	Total Beach	79.89	acre	*(Barton 2019.03.31)*				
	Tails, Dry Sediment	67%	acre	*(Barton 2019.03.31)*				
CIL Tanks		30.19	m^2	*(Ausenco 2021.11.03)*	10	0.9	lb/ton, [as NaCN]	*(Mills 2019.03.20)*

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: K. Lewis
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Grassy Mountain HCN Emissions

Month: February Snow Cover 0 days w/ 0.5+ in. 0% snow 0% ice

Wind: m/s = 3.2 Fw = 1.05

Fugitive Emissions

Area	Source	Cat.	Category Description	Acres	Snow Cover Adjustment Acres	pH	Free CN- g/m3 (3)	T C	pKa	a0	H	Overall (1) Flux (g/m2-s) or kG (m/s)	Fa*Fw	g/s	lb/yr
TSF	Tailings Storag	TA	Tails, Aqueous Surface	8.03	8.03	8.00	10	4.82	9.775	0.9835	0.00262	1.89E-5	0.49	0.0077	538.8
		TW	Tails, Wet Sediment	26.37	26.37							5.31E-8	0.49	0.0028	192.9
		TD	Tails, Dry Sediment	53.53	53.53							2.33E-8	1.00	0.0050	350.3
			Active Surface Subtotal	**34.40**											
Mill															
	Tailings Pipelin	TA	Tails, Aqueous Surface	2.502	2.502	8.00	10.00	4.82	9.775	0.9835	0.00262	1.89E-5	0.57	0.0028	193.8
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CIL Tank 1	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 2	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 3	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 4	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 5	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 6	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 7	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
												Overall			

TOTAL AREA	**90.50**	**90.50**	*Fugitive Total (lb/yr)* **3,580**
			Fugitive Total (ton/yr) **1.79**

Stack Emissions

	lb/hr (2)	hr/yr	lb/yr
EW Cells	0.000567	8,760	**5.0**
Preg/Barren Tanks	0.004	8,760	**35.0**
		Stack Total (lb/yr)	**40.0**
		Stack Total (ton/yr)	**0.02**
		Total (ton/yr)	**1.81**

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: K. Lewis
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Grassy Mountain HCN Emissions

Month: March Snow Cover 0 days w/ 0.5+ in. 0% snow 0% ice

Wind: m/s = 3.2 Fw = 1.05

Fugitive Emissions

Area	Source	Cat.	Category Description	Acres	Snow Cover Adjustment Acres	pH	Free CN- g/m3 (3)	T C	pKa	a0	H	Overall (1) Flux (g/m2-s) or kG (m/s)	Fa*Fw	g/s	lb/yr
TSF	Tailings Storag	TA	Tails, Aqueous Surface	8.03	8.03	8.00	10	8.28	9.685	0.9798	0.00297	1.89E-5	0.49	0.0088	608.5
		TW	Tails, Wet Sediment	26.37	26.37							5.31E-8	0.49	0.0028	192.9
		TD	Tails, Dry Sediment	53.53	53.53							2.33E-8	1.00	0.0050	350.3
			Active Surface Subtotal	**34.40**											
Mill															
	Tailings Pipelin	TA	Tails, Aqueous Surface	2.502	2.502	8.00	10.00	8.28	9.685	0.9798	0.00297	1.89E-5	0.57	0.0031	218.9
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CIL Tank 1	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 2	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 3	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 4	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 5	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 6	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 7	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
												Overall			
			TOTAL AREA	**90.50**	**90.50**										

		Fugitive Total (lb/yr)	**3,675**
		Fugitive Total (ton/yr)	**1.84**

Stack Emissions

	lb/hr (2)	hr/yr	lb/yr
EW Cells	5.67E-4	8,760	**5.0**
Preg/Barren Tanks	0.004	8,760	**35.0**
		Stack Total (lb/yr)	**40.0**
		Stack Total (ton/yr)	**0.02**
		Total (ton/yr)	**1.86**

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: K. Lewis
	PROJECT NO: 343-1	PAGE: 5 OF: 13 SHEET: HCN Monthly
AIR EMISSION CALCULATIONS	SUBJECT: HCN calculations	DATE: June 30, 2022

Grassy Mountain HCN Emissions

Month: April Snow Cover 0 days w/ 0.5+ in. 0% snow 0% ice

Wind: m/s = 3.2 Fw = 1.05

Fugitive Emissions

Area	Source	Cat.	Category Description	Acres	Snow Cover Adjustment Acres	pH	Free CN- g/m3 (3)	T C	pKa	a0	H	Overall (1) Flux (g/m2-s) or kG (m/s)	Fa*Fw	g/s	lb/yr
TSF	Tailings Storag	TA	Tails, Aqueous Surface	8.03	8.03	8.00	10	9.33	9.657	0.9785	0.00309	1.89E-5	0.49	0.0091	631.4
		TW	Tails, Wet Sediment	26.37	26.37							5.31E-8	0.49	0.0028	192.9
		TD	Tails, Dry Sediment	53.53	53.53							2.33E-8	1.00	0.0050	350.3
			Active Surface Subtotal	**34.40**											
Mill															
	Tailings Pipelin	TA	Tails, Aqueous Surface	2.502	2.502	8.00	10.00	9.33	9.657	0.9785	0.00309	1.89E-5	0.57	0.0033	227.1
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CIL Tank 1	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 2	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 3	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 4	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 5	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 6	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 7	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
												Overall			
			TOTAL AREA	**90.50**	**90.50**										

		Fugitive Total (lb/yr)	**3,706**
		Fugitive Total (ton/yr)	**1.85**

Stack Emissions

	lb/hr (2)	hr/yr	lb/yr
EW Cells	5.67E-4	8,760	**5.0**
Preg/Barren Tanks	0.004	8,760	**35.0**
		Stack Total (lb/yr)	**40.0**
		Stack Total (ton/yr)	**0.02**
		Total (ton/yr)	**1.87**

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: K. Lewis
	PROJECT NO: 343-1	PAGE: 6 OF: 13 SHEET: HCN Monthly
AIR EMISSION CALCULATIONS	SUBJECT: HCN calculations	DATE: June 30, 2022

Grassy Mountain HCN Emissions

Month: May Snow Cover 0 days w/ 0.5+ in. 0% snow 0% ice

Wind: m/s = 3.2 Fw = 1.05

Fugitive Emissions

Area	Source	Cat.	Category Description	Acres	Snow Cover Adjustment Acres	pH	Free CN- g/m3 (3)	T C	pKa	a0	H	Overall (1) Flux (g/m2-s) or kG (m/s)	Fa*Fw	g/s	lb/yr
TSF	Tailings Storag	TA	Tails, Aqueous Surface	8.03	8.03	8.00	10	14.83	9.514	0.9703	0.00377	1.89E-5	0.49	0.0110	764.4
		TW	Tails, Wet Sediment	26.37	26.37							5.31E-8	0.49	0.0028	192.9
		TD	Tails, Dry Sediment	53.53	53.53							2.33E-8	1.00	0.0050	350.3
			Active Surface Subtotal	**34.40**											
Mill															
	Tailings Pipelin	TA	Tails, Aqueous Surface	2.502	2.502	8.00	10.00	14.83	9.514	0.9703	0.00377	1.89E-5	0.57	0.0040	274.9
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CIL Tank 1	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 2	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 3	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 4	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 5	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 6	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 7	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
												Overall			
			TOTAL AREA	**90.50**	**90.50**										

		Fugitive Total (lb/yr)	**3,887**
		Fugitive Total (ton/yr)	**1.94**

Stack Emissions

	lb/hr (2)	hr/yr	lb/yr
EW Cells	5.67E-4	8,760	**5.0**
Preg/Barren Tanks	0.004	8,760	**35.0**
		Stack Total (lb/yr)	**40.0**
		Stack Total (ton/yr)	**0.02**
		Total (ton/yr)	**1.96**

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: K. Lewis
	PROJECT NO: 343-1	PAGE: 7 OF: 13 SHEET: HCN Monthly
AIR EMISSION CALCULATIONS	SUBJECT: HCN calculations	DATE: June 30, 2022

Grassy Mountain HCN Emissions

Month: June Snow Cover 0 days w/ 0.5+ in. 0% snow 0% ice

Wind: m/s = 3.2 Fw = 1.05

Fugitive Emissions

Area	Source	Cat.	Category Description	Acres	Snow Cover Adjustment Acres	pH	Free CN- g/m3 (3)	T C	pKa	a0	H	Overall (1) Flux (g/m2-s) or kG (m/s)	Fa*Fw	g/s	lb/yr
TSF	Tailings Storag	TA	Tails, Aqueous Surface	8.03	8.03	8.00	10	23.93	9.278	0.9499	0.00524	1.89E-5	0.49	0.0150	1,041.4
		TW	Tails, Wet Sediment	26.37	26.37							5.31E-8	0.49	0.0028	192.9
		TD	Tails, Dry Sediment	53.53	53.53							2.33E-8	1.00	0.0050	350.3
			Active Surface Subtotal	***34.40***											
Mill															
	Tailings Pipelin	TA	Tails, Aqueous Surface	2.502	2.502	8.00	10.00	23.93	9.278	0.9499	0.00524	1.89E-5	0.57	0.0054	374.6
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CIL Tank 1	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 2	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 3	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 4	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 5	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 6	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 7	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
												Overall			
			TOTAL AREA	**90.50**	**90.50**									***Fugitive Total (lb/yr)***	**4,263**
														Fugitive Total (ton/yr)	**2.13**

Stack Emissions

	lb/hr (2)	hr/yr	lb/yr
EW Cells	5.67E-4	8,760	**5.0**
Preg/Barren Tanks	0.004	8,760	**35.0**
		Stack Total (lb/yr)	**40.0**
		Stack Total (ton/yr)	**0.02**
		Total (ton/yr)	**2.15**

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: K. Lewis
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Grassy Mountain HCN Emissions

Month July Snow Cover 0 days w/ 0.5+ in. 0% snow 0% ice

Wind: m/s = 3.2 Fw = 1.05

Fugitive Emissions

Area	Source	Cat.	Category Description	Acres	Snow Cover Adjustment Acres	pH	Free CN- g/m3 (3)	T C	pKa	a0	H	Overall (1) Flux (g/m2-s) or kG (m/s)	Fa*Fw	g/s	lb/yr
TSF	Tailings Storag	TA	Tails, Aqueous Surface	8.03	8.03	8.00	10	23.65	9.285	0.9507	0.00519	1.89E-5	0.49	0.0148	1,031.5
		TW	Tails, Wet Sediment	26.37	26.37							5.31E-8	0.49	0.0028	192.9
		TD	Tails, Dry Sediment	53.53	53.53							2.33E-8	1.00	0.0050	350.3
			Active Surface Subtotal	***34.40***											
Mill															
	Tailings Pipelin	TA	Tails, Aqueous Surface	2.502	2.502	8.00	10.00	23.65	9.285	0.9507	0.00519	1.89E-5	0.57	0.0053	371.0
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CIL Tank 1	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 2	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 3	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 4	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 5	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 6	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 7	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
												Overall			
			TOTAL AREA	**90.50**	**90.50**									***Fugitive Total (lb/yr)***	**4,250**
														Fugitive Total (ton/yr)	**2.12**

Stack Emissions

	lb/hr (2)	hr/yr	lb/yr
EW Cells	5.67E-4	8,760	**5.0**
Preg/Barren Tanks	0.004	8,760	**35.0**
		Stack Total (lb/yr)	**40.0**
		Stack Total (ton/yr)	**0.02**
		Total (ton/yr)	**2.14**

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: K. Lewis
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Grassy Mountain HCN Emissions

Month: August Snow Cover 0 days w/ 0.5+ in. 0% snow 0% ice

Wind: m/s = 3.2 Fw = 1.05

Fugitive Emissions

Area	Source	Cat.	Category Description	Acres	Snow Cover Adjustment Acres	pH	Free CN- g/m3 (3)	T C	pKa	a0	H	Overall (1) Flux (g/m2-s) or kG (m/s)	Fa*Fw	g/s	lb/yr
TSF	Tailings Storag	TA	Tails, Aqueous Surface	8.03	8.03	8.00	10	24.51	9.263	0.9482	0.00536	1.89E-5	0.49	0.0153	1,061.6
		TW	Tails, Wet Sediment	26.37	26.37							5.31E-8	0.49	0.0028	192.9
		TD	Tails, Dry Sediment	53.53	53.53							2.33E-8	1.00	0.0050	350.3
			Active Surface Subtotal	***34.40***											
Mill															
	Tailings Pipelin	TA	Tails, Aqueous Surface	2.502	2.502	8.00	10.00	24.51	9.263	0.9482	0.00536	1.89E-5	0.57	0.0055	381.8
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CIL Tank 1	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 2	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 3	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 4	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 5	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 6	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 7	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
												Overall			
			TOTAL AREA	**90.50**	**90.50**									*Fugitive Total (lb/yr)*	**4,291**
														Fugitive Total (ton/yr)	**2.15**

Stack Emissions

	lb/hr (2)	hr/yr	lb/yr
EW Cells	5.67E-4	8,760	**5.0**
Preg/Barren Tanks	0.004	8,760	**35.0**
		Stack Total (lb/yr)	**40.0**
		Stack Total (ton/yr)	**0.02**
		Total (ton/yr)	**2.17**

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: K. Lewis
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Grassy Mountain HCN Emissions

Month September Snow Cover 0 days w/ 0.5+ in. 0% snow 0% ice

Wind: m/s = 3.2 Fw = 1.05

Fugitive Emissions

Area	Source	Cat.	Category Description	Acres	Snow Cover Adjustment Acres	pH	Free CN- g/m3 (3)	T C	pKa	a0	H	Overall (1) Flux (g/m2-s) or kG (m/s)	Fa*Fw	g/s	lb/yr
TSF	Tailings Storag	TA	Tails, Aqueous Surface	8.03	8.03	8.00	10	17.95	9.433	0.9644	0.00422	1.89E-5	0.49	0.0122	850.9
		TW	Tails, Wet Sediment	26.37	26.37							5.31E-8	0.49	0.0028	192.9
		TD	Tails, Dry Sediment	53.53	53.53							2.33E-8	1.00	0.0050	350.3
			Active Surface Subtotal	***34.40***											
Mill															
	Tailings Pipelin	TA	Tails, Aqueous Surface	2.502	2.502	8.00	10.00	17.95	9.433	0.9644	0.00422	1.89E-5	0.57	0.0044	306.0
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CIL Tank 1	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 2	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 3	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 4	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 5	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 6	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 7	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
												Overall			

	TOTAL AREA	**90.50**	**90.50**

Fugitive Total (lb/yr) **4,004**

Fugitive Total (ton/yr) **2.00**

Stack Emissions

	lb/hr (2)	hr/yr	lb/yr
EW Cells	5.67E-4	8,760	**5.0**
Preg/Barren Tanks	0.004	8,760	**35.0**
Stack Total (lb/yr)			**40.0**
Stack Total (ton/yr)			**0.02**
Total (ton/yr)			**2.02**

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Grassy Mountain HCN Emissions

Month October Snow Cover 0 days w/ 0.5+ in. 0% snow 0% ice

Wind: m/s 3.2 Fw 1.05

Fugitive Emissions

Area	Source	Cat.	Category Description	Acres	Snow Cover Adjustment Acres	pH	Free CN- g/m3 (3)	T C	pKa	a0	H	Overall (1) Flux (g/m2-s) kG (m/s)	Fa*Fw	g/s	lb/yr
TSF	Tailings Storag	TA	Tails, Aqueous Surface	8.03	8.03	8.00	10	12.79	9.567	0.9736	0.00350	1.89E-5	0.49	0.0102	712.4
		TW	Tails, Wet Sediment	26.37	26.37							5.31E-8	0.49	0.0028	192.9
		TD	Tails, Dry Sediment	53.53	53.53							2.33E-8	1.00	0.0050	350.3
			Active Surface Subtotal	**34.40**											
Mill															
	Tailings Pipelin	TA	Tails, Aqueous Surface	2.502	2.502	8.00	10.00	12.79	9.567	0.9736	0.00350	1.89E-5	0.57	0.0037	256.2
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CIL Tank 1	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 2	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 3	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 4	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 5	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 6	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 7	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
												Overall			

TOTAL AREA	**90.50**	**90.50**	*Fugitive Total (lb/yr)* **3,816**
			Fugitive Total (ton/yr) **1.91**

Stack Emissions

	lb/hr (2)	hr/yr	lb/yr
EW Cells	5.67E-4	8,760	**5.0**
Preg/Barren Tanks	0.004	8,760	**35.0**
		Stack Total (lb/yr)	**40.0**
		Stack Total (ton/yr)	**0.02**
		Total (ton/yr)	**1.93**

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: K. Lewis
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Grassy Mountain HCN Emissions

Month November Snow Cover 0 days w/ 0.5+ in. 0% snow 0% ice

Wind: m/s = 3.2 Fw = 1.05

Fugitive Emissions

Area	Source	Cat.	Category Description	Acres	Snow Cover Adjustment Acres	pH	Free CN- g/m3 (3)	T C	pKa	a0	H	Overall (1) Flux (g/m2-s) or kG (m/s)	Fa*Fw	g/s	lb/yr
TSF	Tailings Storag	TA	Tails, Aqueous Surface	8.03	8.03	8.00	10	1.41	9.863	0.9865	0.00232	1.89E-5	0.49	0.0069	477.5
		TW	Tails, Wet Sediment	26.37	26.37							5.31E-8	0.49	0.0028	192.9
		TD	Tails, Dry Sediment	53.53	53.53							2.33E-8	1.00	0.0050	350.3
			Active Surface Subtotal	***34.40***											
Mill															
	Tailings Pipelin	TA	Tails, Aqueous Surface	2.502	2.502	8.00	10.00	1.41	9.863	0.9865	0.00232	1.89E-5	0.57	0.0025	171.7
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CIL Tank 1	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 2	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 3	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 4	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 5	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 6	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 7	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
												Overall			
			TOTAL AREA	**90.50**	**90.50**									***Fugitive Total (lb/yr)***	**3,496**
														Fugitive Total (ton/yr)	**1.75**

Stack Emissions

	lb/hr (2)	hr/yr	lb/yr
EW Cells	5.67E-4	8,760	**5.0**
Preg/Barren Tanks	0.004	8,760	**35.0**
		Stack Total (lb/yr)	**40.0**
		Stack Total (ton/yr)	**0.02**
		Total (ton/yr)	**1.77**

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Grassy Mountain HCN Emissions

Month December Snow Cover 0 days w/ 0.5+ in. 0% snow 0% ice

Wind: m/s = 3.2 Fw = 1.05

Fugitive Emissions

Area	Source	Cat.	Category Description	Acres	Snow Cover Adjustment Acres	pH	Free CN- g/m3 (3)	T C	pKa	a0	H	Overall (1) Flux (g/m2-s) or kG (m/s)	Fa*Fw	g/s	lb/yr
TSF	Tailings Storag	TA	Tails, Aqueous Surface	8.03	8.03	8.00	10	0.91	9.876	0.9869	0.00227	1.89E-5	0.49	0.0067	469.2
		TW	Tails, Wet Sediment	26.37	26.37							5.31E-8	0.49	0.0028	192.9
		TD	Tails, Dry Sediment	53.53	53.53							2.33E-8	1.00	0.0050	350.3
			Active Surface Subtotal	**34.40**											
Mill															
	Tailings Pipelin	TA	Tails, Aqueous Surface	2.502	2.502	8.00	10.00	0.91	9.876	0.9869	0.00227	1.89E-5	0.57	0.0024	168.7
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CN Leach Tank	TK	Tanks	0.0075	0.007	10.00	1000	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0060	418.9
	CIL Tank 1	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 2	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 3	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 4	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 5	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 6	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
	CIL Tank 7	TK	Tanks	0.0075	0.007	10.00	500	25.00	9.250	0.1510	0.00545	3.11E-4	0.78	0.0030	209.4
												Overall			

TOTAL AREA	**90.50**	**90.50**	***Fugitive Total (lb/yr)*** **3,485**
			Fugitive Total (ton/yr) **1.74**

Stack Emissions

	lb/hr (2)	hr/yr	lb/yr
EW Cells	5.67E-4	8,760	**5.0**
Preg/Barren Tanks	0.004	8,760	**35.0**
		Stack Total (lb/yr)	**40.0**
		Stack Total (ton/yr)	**0.02**
		Total (ton/yr)	**1.76**

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: M. Mavko
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Conversions

60	sec/min
60	min/hr
24	hr/day
365	day/yr
8,760	hr/yr
3,600	s/hr
2,000	lb/ton
453.593	g/lb
3.28084	ft/m
35.3147	ft^3/m^3
7,000	gr/lb
1.341	hp/kW
907.1858	kg/ton
459.67	°R at 0°F
68	°F, standard
7,000	Btu/hp-hr
7.05	lb/gal distillate oil
137,000	Btu/gal
2.2369	mi/hr per m/s
7.48052	gal/ft^3
1.10231	ton/t
2.20462	lb/kg
1,609.3	m/mi
4,046.9	m^2/acre
43,560	ft^2/acre
12	in/ft
1.102	ton/mt
1.0E+6	g/mt
3	ft/yd
1.0E+6	scf/MMscf
10,000	m^2/ha
1,000	kg/mt
273.15	K at 0°C
32	°F at 0°C
1.8	°F/°C
1,000	ng/µg
0.293297	MW-hr/MMBtu
12	mo/yr
5,280	ft/mi
29.9213	inHg/atm

Fuel Specifications

15	ppm S content	*40 CFR 80.510 (Non-road diesel)*
7.05	lb/gal distillate oi	*(EPA 1994), App. A*
32.065	lb/lb-mol S, and	
64.06	lb/lb-mol SO2	
7,000	Btu/hp-hr	*(EPA 1995), Sec. 3.3, (Diesel engine)*
0.00939	MMBtu/kW-hr	Diesel
0.137	MMBtu/gal diese	*(EPA 1995), App. A (Diesel)*
0.0915	MMBtu/gal Propane	
3.78541	liter/gal	

Bulk Material

2,750	kg/m^3, Limestone	*https://www.engineeringtoolbox.com/soil-rock-bulking-factor-d_1557.html*
4,635	lb/yd^3	
4,024	lb/yd^3, concrete	*(EPA 1995)AP-42 p. 11-12.9, 6/06*

7,000 Btu/hp-hr	*(EPA 1995), Sec. 3.3, (Diesel)*
7.05 lb/gal distillate oil	*(EPA 1995), Appendix A 'Weights of Selected Substances' (Distillate oil)*
137,000 Btu/gal	*(EPA 1995), App. A (Diesel)*

14.5833	troy oz/lb	
1	(g/s)/(g/s)	
0.126	(g/s)/(lb/hr)	
0.00525	(g/s)/(lb/day)	
0.02877	(g/s)/(ton/yr)	

1 g/dscm = 0.437 grain/dscf *http://www.unitconversion.org/unit_converter/density.html*

52 week/yr

Constants

M.W. SO2	64.0638
M.W. S	32.065
M.W. O	15.9994

Diesel SO2

$$\frac{15 \text{ parts S}}{1.0E+06} \times \frac{7.05 \text{ lb}}{\text{gal diesel}} \times \frac{64.06 \text{ SO2}}{32.065 \text{ S}} \times \frac{\text{gal}}{0.137 \text{ MMBtu}} \times \frac{0.00939 \text{ MMBtu}}{\text{kW-hr}} \times \frac{453.593 \text{ g}}{\text{lb}} = 6.57E\text{-}03 \frac{\text{g SO2}}{\text{kW-hr}}$$

Propane SO2

$$\frac{185 \text{ lb S}}{1.00E+06 \text{ lb C3H8}} \times \frac{44.08 \text{ lb C3H8}}{\text{lb mol}} \times \frac{\text{lb mol}}{359.05 \text{ SCF (0C)}} \times \frac{7{,}000 \text{ gr}}{\text{lb}} \times \frac{100 \text{ SCF}}{100\text{SCF}} = 15.90 \frac{\text{gr S}}{100 \text{ SCF}}$$

Propane heating value 91,500 *Btu/gal* *(EPA 1995), Table 1.5-1 (07/08) Footnote a*

AP-42, Chapter 13.2.4 Particle Size Fractions

0.35	PM10
0.053	PM2.5

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Fuel Combustion Exhaust Flow (EPA Method 19, F-factor)

Propane Heater

F-factor	8,710	dscf/MMBtu	Propane, dry		
O2%dry	3	%		9	%
Heat input	1	MMBtu/hr			
Standard exhaust flow	10,170	dscf/hr		15,297	dscf/hr
	169	dscfm		255	dscfm
Vol % moisture	15.0%	standard for propane boilers			
Temperature	360	°F, Engineering Toolbox* (LPG heating appliances)			
Pressure, site	0.87	atm			
Actual exhaust flow	356	acfm (wet)/MMBtu		536	acfm (wet)/MMBtu

Diesel Engine

F-factor	9,190	dscf/MMBtu	Oil, dry		
O2%dry	9	%			
Heat input	0.007	MMBtu/hp-hr	*(EPA 1995), Sec. 3.3, (Diesel engine)*		
Standard exhaust flow	113	dscf/hp-hr			
	1.9	dscfm/hp		2.5	dscfm/kW
Vol % moisture	8.0%	standard for diesel engines			
Temperature	1,100	°F, Engineering Toolbox* (diesel exhaust)			
Pressure, site	0.87	atm			
Actual exhaust flow	7.0	acfm (wet)/hp		9.3	acfm (wet)/kW

* *http://www.engineeringtoolbox.com/fuels-exhaust-temperatures-d_168.html*

Refinery Exhaust Flow

dscfm acfm temp_F dia_ft

Source	Design Rate	Water	Exhaust Parameters Flow dscfm	Flow acfm	Temp F	Velocity ft/s	Dia ft	BH PM gr/dscf
Carbon Regeneration Kiln (Drum)	0.2 ton/hr	1%	80	110	150	10	0.48	
Electrowinning Cells & Pregnant Solution Tank		4%	2,660	3,380	100	161	0.67	
Mercury Retort		1%	16	20	150	5	0.29	
Melting Furnace	0.60 MMBtu/hr	1%	3,500	4,700	150	100	1	0.022
	7.5 hr/day							
	82.9 liter/day, Diesel							
	2 day/week							

(NDEP 2017.07), Exhaust Parameters

(Ausenco 2021.11.15), Furnace Design Rate Multipied by 1.5-2x for design and operational flexibility

Site Pressure Calculation

http://www.sensorsone.com/altitude-pressure-units-conversion/

~ Site Elev. (m)	~ Site Elev. (ft)
1,160	3,805.8

Elev(ft)	Pres(inHg)
3,000	26.817
4,000	25.842

Site (ft)	Site (inHg)	Site(atm)
3,805.8	26.03137	0.86999

Appendix F – Categorically Exempt Sources Checklist (AQ523)

CATEGORICALLY EXEMPT TOXICS EMISSIONS UNITS — ANSWER SHEET

Facility name: Grassy Mountain Permit Number:

Indicate which of the following categorically exempt activities occur at this facility by checking the appropriate columns below. Submit this form electronically with your Cleaner Air Oregon (CAO) Emissions Inventory AQ520 form to meet the reporting requirements in OAR 340-245-0040(4)(a)(A) for categorically exempt Toxics Emissions Units (TEUs). This form is the complete list of categorically exempt TEUs, which can be found in the division 245 rules under OAR 340-245-0060(3)(b).

Yes	No	Categorically Exempt TEU Activities
☑	☐	Evaporative and tail pipe emissions from on-site motor vehicle operation.
☐	☑	Distillate oil, kerosene, gasoline, natural gas or propane burning equipment, provided the aggregate expected actual emissions of the equipment identified does not exceed the de minimis level for any regulated pollutant, based on the expected maximum annual operation of the equipment. If a source's expected emissions from all such equipment exceed the de minimis levels, then the source may identify a subgroup of such equipment as categorically exempt with the remainder not designated as an exempt TEU. The following equipment may never be included as part of the exempt TEU: A. Any individual distillate oil, kerosene or gasoline burning equipment with a rating greater than 0.4 million Btu/hour; and B. Any individual natural gas or propane burning equipment with a rating greater than 2.0 million Btu/hour.
☐	☑	Distillate oil, kerosene, gasoline, natural gas or propane burning equipment brought on site for six months or less for maintenance, construction or similar purposes, such as but not limited to generators, pumps, hot water pressure washers and space heaters, provided that any such equipment that performs the same function as the permanent equipment, must be operated within the source's existing PSEL.
☐	☑	Office activities.
☐	☑	Food service activities.
☑	☐	Janitorial activities.
☐	☑	Personal care activities.
☑	☐	Grounds keeping activities, including, but not limited to building painting and road and parking lot maintenance.
☐	☑	On-site laundry activities.
☐	☑	On-site recreation facilities.
☐	☑	Instrument calibration.
☑	☐	Automotive storage garages.

☑	☐	Refrigeration systems with less than 50 pounds of charge of ozone depleting substances regulated under Title VI, including pressure tanks used in refrigeration systems but excluding any combustion equipment associated with such systems.
☑	☐	Temporary construction activities.
☑	☐	Warehouse activities.
☑	☐	Accidental fires and fire suppression.
☐	☑	Air vents from compressors.
☐	☑	Air purification systems.
☐	☑	Continuous emissions monitoring lines.
☐	☑	Demineralized water tanks.
☐	☑	Pre-treatment of municipal water, including use of deionized water purification systems.
☐	☑	Electrical charging stations.
☐	☑	Fire brigade training.
☐	☑	Instrument air dryers and distribution.
☐	☑	Fully enclosed process raw water filtration systems.
☑	☐	Electric motors.
☑	☐	Pressurized tanks containing gaseous compounds that do not contain toxic air contaminants.
☐	☑	Vacuum sheet stacker vents.
☐	☑	Emissions from wastewater discharges to publicly owned treatment works (POTW) provided the source is authorized to discharge to the POTW, not including on-site wastewater treatment and/or holding facilities.
☐	☑	Log ponds.
☑	☐	Stormwater settling basins.
☐	☑	Paved roads and paved parking lots within an urban growth boundary.
☑	☐	Hazardous air pollutant emissions in fugitive dust from paved and unpaved roads except for those sources that have processes or activities that contribute to the deposition and entrainment of hazardous air pollutants from surface soils.
☑	☐	Health, safety, and emergency response activities.
☐	☑	Non-diesel, compression ignition emergency generators* and pumps used only during loss of primary equipment or utility service due to circumstances beyond the

		reasonable control of the owner or operator, or to address a power emergency, provided that the aggregate horsepower rating of all stationary emergency generator and pump engines is not more than 3,000 horsepower. If the aggregate horsepower rating of all the stationary emergency generator and pump engines is more than 3,000 horsepower, then no emergency generators and pumps at the source may be considered categorically exempt. ***All spark ignition engines remain exempt.**
☐	☑	Non-contact steam vents and leaks and safety and relief valves for boiler steam distribution systems.
☐	☑	Non-contact steam condensate flash tanks.
☐	☑	Non-contact steam vents on condensate receivers, deaerators and similar equipment.
☐	☑	Boiler blowdown tanks.
☐	☑	Ash piles maintained in a wetted condition and associated handling systems and activities.

Appendix G – CAO AQ520 Forms

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Facility Information	
Facility Name	Grassy Mountain Mine
Facility Address	(T21S, R44E)
City	Malhuer County
Zip Code	
Source Number (for existing sources)	
Facility Contact	Glen Van Treek
Phone Number	(775)625-3600

INSTRUCTIONS:
- **Toxic Emissions Unit and Stack/Fugitive ID**: use IDs consistent with permit identifiers if applicable.
- **Activity Units/Type:** where possible, maintain consistency with permitted/reported Units/Type.
- **Max Daily Activity:** for semi-continuous/batch processes this value should account for co-occurring activities, process and/or maintenance, that would account for the potential maximum emissions activities for this pollutant.
  - **Actual:** values should be based on the last full year reported to DEQ or estimates of normal activity (new sources).
  - **Capacity:** maximum activity value achievable with 100% operational up-time for this unit.
  - **Requested PTE:** values that a source is requesting to be permitted on that differ from "Actuals" and "Capacity".

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Emissions Unit Information			Stack/Fugitive Information		Activity Information							
							Annual - Chronic [units/year]			Max Daily - Acute [units/day]		
Toxics Emissions Unit ID	Unit Description	Control Device[s]	Emission Type (e.g. Point or Fugitive)	Stack or Fugitive ID	Units (e.g. hours operation, tons material, gallons)	Description/Type	Actual	Requested PTE	Capacity	Actual	Requested PTE	Capacity
TEU-1	**Widget Maker 1 (EXAMPLE)**	**Widget Waste RCO**	**Point**	**ST-1**	**tons**	**Input Material X**	**100**	**140**	**200**	**0.3**	**0.5**	**0.8**
OC	Ore crusher		Fugitive	OC1-13	ton	Ore		297840	297840		816	816
BC	Borrow crusher		Fugitive	BC1-10	ton	Rock from Borrow Pit		247000	247000		950	950
HA	Administration HVAC		Point	HA	MMBtu	Propane		8760	8760		24	24
HPO	Plant Office and Dry HVAC		Point	HPO	MMBtu	Propane		8760	8760		24	24
HL	Laboratory HVAC		Point	HL	MMBtu	Propane		8760	8760		24	24
HWW	Plant Workshop and Warehouse HVAC		Point	HWW	MMBtu	Propane		8760	8760		24	24
HTW	Truck Workshop and Warehouse HVAC		Point	HTW	MMBtu	Propane		17520	17520		48	48
HMO	Mine Office and Changehouse HVAC		Point	HMO	MMBtu	Propane		8760	8760		24	24
CKD	Carbon Regeneration Kiln (Drum)	VS1, CF1	Point	CKD	ton	Carbon		1752	1752		4.8	4.8
CKDHG	Carbon Regeneration Kiln (Drum) (Hg emissions only)	VS1, CF1	Point	CKD	Hours of operation			8760	8760		24	24
EW	Electrowinning Cells & Pregnant Solution Tank	CF3	Point	EW	Hours of operation			8760	8760		24	24
MR	Mercury Retort	CF3, CD1	Point	MR	Hours of operation			8760	8760		24	24
MFP	Melting Furnace Particulate	CF2, BH1	Point	MF	MMBtu	Wet Au concentrate		467.9029484	467.9029484		4.499066812	0.115068493
MFHG	Melting Furnace (Hg emissions only)	CF2, BH1	Point	MF	Hours of operation			780	780		24	24
MFD	Melting Furnace Diesel Combustion	CF2, BH1	Point	MF	MMBtu	Diesel		467.9029484	467.9029484		4.499066812	4.499066812
UFD	Underground Fugitive Dust - Material Handling, drilling, blasting		Fugitive	UG	ton	Ore and Rock		291200	291200		1400	1400
AFD	Fugitive Dust - Material Handling, wind erosion, drilling, blasting		Fugitive	LAST, WRSF, CRF, S	ton	Ore and Rock		247000	247000		950	950
TSF	Tailings Storage Facility		Fugitive	TSF	Hours of operation			8760	8760		24	24
POND	Tailings Pipeline Reclaim Pond		Fugitive	POND	Hours of operation			8760	8760		24	24
LEACH1	CN Leach Tank 1		Fugitive	LEACH1	Hours of operation			8760	8760		24	24
LEACH2	CN Leach Tank 2		Fugitive	LEACH2	Hours of operation			8760	8760		24	24
CILTANK1	CIL Tank 1		Fugitive	CILTANK1	Hours of operation			8760	8760		24	24
CILTANK2	CIL Tank 2		Fugitive	CILTANK2	Hours of operation			8760	8760		24	24
CILTANK3	CIL Tank 3		Fugitive	CILTANK3	Hours of operation			8760	8760		24	24
CILTANK4	CIL Tank 4		Fugitive	CILTANK4	Hours of operation			8760	8760		24	24
CILTANK5	CIL Tank 5		Fugitive	CILTANK5	Hours of operation			8760	8760		24	24
CILTANK6	CIL Tank 6		Fugitive	CILTANK6	Hours of operation			8760	8760		24	24
CILTANK7	CIL Tank 7		Fugitive	CILTANK7	Hours of operation			8760	8760		24	24
CEM1	Cement/Shotcrete loading to silo		Point	CEM1	ton	Cement and Supplement		18741.93548	18741.93548		80	80
CEM2	Cement/Shotcrete unloading to batch plant		Point	CEM2	ton	Cement and Supplement		18741.93548	18741.93548		80	80
CEM3	Aggregate transfer		Fugitive	CEM3	ton	Aggregate		249000	249000		1125	1125
CEM4	Weigh hopper loading		Fugitive	CEM4	ton	Aggregate		249000	249000		1125	1125
CEM5	Mixer loading (central mix)		Point	CEM5	ton	Cemented Rock Fill		18741.93548	18741.93548		84.88	84.88
UDP	Underground Nonroad Activity (incl. hauling)		Fugitive	UDP	MMBtu	Diesel		22486.04154	22486.04154		108.105969	108.105969
EDG1	Emergency Generator (Mfr. Yr. >2007; diesel)		Point	EDG1	MMBtu	Diesel		1877.4	1877.4		450.576	450.576
EDFP	Emergency Diesel Fire Pump		Point	EDFP	MMBtu	Diesel		187.74	187.74		45.0576	45.0576
LS1	Lime Silo Loading		Point	LS1	ton	Lime		328.5	328.5		55	55
LS2	Lime Silo Unloading to Lime Slaker		Point	LS2	ton	Lime		328.5	328.5		0.9	0.9
TG1	Mine Site Gasoline Tank #1		Point	TG1	gal	Gasoline		120000	120000		328.7671233	328.7671233
TD1	Mine Site Diesel Tank #1		Point	TD1	gal	Diesel		240000	240000		657.5342466	657.5342466
TD2	Mine Site Diesel Tank #2		Point	TD2	gal	Diesel		15000	15000		41.09589041	41.09589041
UB	Underground blasting, emulsion VOCs		Fugitive	UG	ton	Emulsion		529.0133333	529.0133333		2.543333333	2.543333333
BRWB	Borrow blasting, ANFO VOCs		Fugitive	BRWBLAST	ton	ANFO		68.25	68.25		0.2625	0.2625
UBD	Underground blasting, emulsion metals		Fugitive	UG	MMBtu	Diesel		1233.614071	1233.614071		5.930836879	5.930836879
BRWBD	Borrow blasting, ANFO metals		Fugitive	BRWBLAST	MMBtu	Diesel		159.1531915	159.1531915		0.61212766	0.61212766
Categorically Exempt List												
LABSP	Sample Preparation		Point	LAB	ton	Samples		2190	2190		6	6
LABFA	Fire Assay		Point	LAB	ton	Samples		9.125	9.125		0.025	0.025

INSTRUCTIONS:
- **CAS or DEQ ID**: either use the drop-down provided or simply cut and paste each pollutant CAS number or DEQ ID (see DEQ Pollutant List Worksheet) emitted by the referenced TEU.
- **Chemical Name:** if a CAS number or DEQ ID is entered in *Column B*, *Column C* should perform a lookup from the DEQ Air Toxics list; alternatively, simply cut and paste the chemical names that correspond to the CAS numbers/DEQ ID in *Column B* if applicable.
- **Control Efficiency:** enter the pollutant specific control efficiency - this should include all capture and removal process efficiencies applicable to each individual pollutant.
- **EF Values:** provide emission factors for Annual and Max Daily conditions; if Annual and Max Daily EF values are equivalent, please enter value in Annual (*Column F*).
- **Emission Factor Information Reference/Notes:** provide EF references (e.g. Source Tests, AP-42, Engineering Estimates, etc) as well as any additional notes (e.g. control efficiencies).
- **Calculated Emissions:** follow guidance in "*Form Instructions*" worksheet for specific formulas.

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Toxic Emissions Unit ID	Pollutant Information		Control Efficiency	Emission Factor Information				Calculated Emissions					
				EF Values		Units	Reference/Notes	Annual - Chronic [lb/yr]			Max Daily - Acute [lb/day]		
	CAS or DEQ ID	Chemical Name		Annual - Chronic	Max Daily - Acute			Actual	Requested PTE	Capacity	Actual	Requested PTE	Capacity
TEU-1	61-82-5	Amitrole	97.50%	2.5		lb/ton	Annual and max daily EF values are the same for this TEU and its po	6.25	8.75	12.5	0.01875	0.03125	0.05
TEU-1	7440-38-2	Arsenic and compounds	0.00%	0.1		lb/ton	The control efficiency does not apply to this pollutant	10	14	20	0.03	0.05	0.08
OC	7440-36-0	Antimony and compounds		2.49E-07	2.49E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		7.41E-02	7.41E-02		2.03E-04	2.03E-04
OC	7440-38-2	Arsenic and compounds		9.25E-07	9.25E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.76E-01	2.76E-01		7.55E-04	7.55E-04
OC	7440-41-7	Beryllium and compounds		6.54E-09	6.54E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.95E-03	1.95E-03		5.34E-06	5.34E-06
OC	7440-43-9	Cadmium and compounds		1.20E-09	1.20E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		3.57E-04	3.57E-04		9.79E-07	9.79E-07
OC	18540-29-9	Chromium VI, chromate and dichromate particulate		1.67E-07	1.67E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		4.98E-02	4.98E-02		1.36E-04	1.36E-04
OC	7440-48-4	Cobalt and compounds		8.52E-09	8.52E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.54E-03	2.54E-03		6.95E-06	6.95E-06
OC	7439-92-1	Lead and compounds		3.87E-08	3.87E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.15E-02	1.15E-02		3.16E-05	3.16E-05
OC	7439-96-5	Manganese and compounds		4.55E-07	4.55E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.36E-01	1.36E-01		3.71E-04	3.71E-04
OC	7439-97-6	Mercury and compounds		1.34E-08	1.34E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		4.00E-03	4.00E-03		1.10E-05	1.10E-05
OC	365	Nickel compounds, insoluble		2.77E-08	2.77E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		8.26E-03	8.26E-03		2.26E-05	2.26E-05
OC	7440-39-3	Barium and compounds		3.97E-06	3.97E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.18E+00	1.18E+00		3.24E-03	3.24E-03
OC	7440-50-8	Copper and compounds		1.07E-07	1.07E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		3.18E-02	3.18E-02		8.72E-05	8.72E-05
OC	7440-62-2	Vanadium (fume or dust)		9.63E-08	9.63E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.87E-02	2.87E-02		7.86E-05	7.86E-05
OC	7440-66-6	Zinc and compounds		9.86E-08	9.86E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.94E-02	2.94E-02		8.05E-05	8.05E-05
OC	1313-27-5	Molybdenum trioxide		5.27E-08	5.27E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.57E-02	1.57E-02		4.30E-05	4.30E-05
OC	7440-22-4	Silver and compounds		5.60E-08	5.60E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.67E-02	1.67E-02		4.57E-05	4.57E-05
OC	7631-86-9	Silica, crystalline (respirable)		1.45E-03	1.45E-03	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		4.32E+02	4.32E+02		1.18E+00	1.18E+00
BC	7440-36-0	Antimony and compounds		2.76E-06	2.76E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		6.81E-01	6.81E-01		2.62E-03	2.62E-03
BC	7440-38-2	Arsenic and compounds		8.10E-06	8.10E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.00E+00	2.00E+00		7.70E-03	7.70E-03
BC	7440-41-7	Beryllium and compounds		1.04E-07	1.04E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.57E-02	2.57E-02		9.87E-05	9.87E-05
BC	7440-43-9	Cadmium and compounds		1.19E-08	1.19E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.95E-03	2.95E-03		1.13E-05	1.13E-05
BC	18540-29-9	Chromium VI, chromate and dichromate particulate		1.31E-06	1.31E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		3.24E-01	3.24E-01		1.24E-03	1.24E-03
BC	7440-48-4	Cobalt and compounds		1.58E-07	1.58E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		3.90E-02	3.90E-02		1.50E-04	1.50E-04
BC	7439-92-1	Lead and compounds		4.73E-07	4.73E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.17E-01	1.17E-01		4.49E-04	4.49E-04
BC	7439-96-5	Manganese and compounds		5.55E-06	5.55E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.37E+00	1.37E+00		5.27E-03	5.27E-03
BC	7439-97-6	Mercury and compounds		1.38E-07	1.38E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		3.41E-02	3.41E-02		1.31E-04	1.31E-04
BC	365	Nickel compounds, insoluble		2.56E-07	2.56E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		6.33E-02	6.33E-02		2.43E-04	2.43E-04
BC	7440-39-3	Barium and compounds		4.18E-05	4.18E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.03E+01	1.03E+01		3.97E-02	3.97E-02
BC	7440-50-8	Copper and compounds		5.61E-07	5.61E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		1.39E-01	1.39E-01		5.33E-04	5.33E-04
BC	7440-62-2	Vanadium (fume or dust)		1.16E-06	1.16E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.86E-01	2.86E-01		1.10E-03	1.10E-03
BC	7440-66-6	Zinc and compounds		1.06E-06	1.06E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.61E-01	2.61E-01		1.00E-03	1.00E-03
BC	1313-27-5	Molybdenum trioxide		3.80E-07	3.80E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		9.39E-02	9.39E-02		3.61E-04	3.61E-04
BC	7440-22-4	Silver and compounds		1.06E-07	1.06E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		2.62E-02	2.62E-02		1.01E-04	1.01E-04
BC	7631-86-9	Silica, crystalline (respirable)		1.35E-02	1.35E-02	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9		3.33E+03	3.33E+03		1.28E+01	1.28E+01
UB	115-07-1	Propylene		2.80E-02	2.80E-02	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.48E+01	1.48E+01		7.12E-02	7.12E-02
UB	106-99-0	1,3-Butadiene		1.52E-03	1.52E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		8.04E-01	8.04E-01		3.87E-03	3.87E-03
UB	75-05-8	Acetonitrile		2.00E-02	2.00E-02	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.06E+01	1.06E+01		5.09E-02	5.09E-02
UB	107-02-8	Acrolein		2.00E-03	2.00E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.06E+00	1.06E+00		5.09E-03	5.09E-03
UB	67-64-1	Acetone		1.36E-03	1.36E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		7.19E-01	7.19E-01		3.46E-03	3.46E-03
UB	67-63-0	Isopropyl alcohol		2.60E-03	2.60E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.38E+00	1.38E+00		6.61E-03	6.61E-03
UB	107-13-1	Acrylonitrile		3.80E-03	3.80E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		2.01E+00	2.01E+00		9.66E-03	9.66E-03
UB	71-43-2	Benzene		2.40E-02	2.40E-02	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.27E+01	1.27E+01		6.10E-02	6.10E-02
UB	108-88-3	Toluene		3.60E-03	3.60E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.90E+00	1.90E+00		9.16E-03	9.16E-03
UB	100-41-4	Ethyl benzene		2.40E-04	2.40E-04	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.27E-01	1.27E-01		6.10E-04	6.10E-04
UB	100-42-5	Styrene		1.80E-03	1.80E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		9.52E-01	9.52E-01		4.58E-03	4.58E-03
UB	108-67-8	1,3,5-Trimethylbenzene		5.60E-04	5.60E-04	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		2.96E-01	2.96E-01		1.42E-03	1.42E-03
UB	91-20-3	Naphthalene		3.80E-03	3.80E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		2.01E+00	2.01E+00		9.66E-03	9.66E-03
BRWB	115-07-1	Propylene		2.80E-02	2.80E-02	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.91E+00	1.91E+00		7.35E-03	7.35E-03
BRWB	106-99-0	1,3-Butadiene		1.52E-03	1.52E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.04E-01	1.04E-01		3.99E-04	3.99E-04
BRWB	75-05-8	Acetonitrile		2.00E-02	2.00E-02	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.37E+00	1.37E+00		5.25E-03	5.25E-03
BRWB	107-02-8	Acrolein		2.00E-03	2.00E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.37E-01	1.37E-01		5.25E-04	5.25E-04
BRWB	67-64-1	Acetone		1.36E-03	1.36E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		9.28E-02	9.28E-02		3.57E-04	3.57E-04
BRWB	67-63-0	Isopropyl alcohol		2.60E-03	2.60E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.77E-01	1.77E-01		6.83E-04	6.83E-04
BRWB	107-13-1	Acrylonitrile		3.80E-03	3.80E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		2.59E-01	2.59E-01		9.98E-04	9.98E-04
BRWB	71-43-2	Benzene		2.40E-02	2.40E-02	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.64E+00	1.64E+00		6.30E-03	6.30E-03
BRWB	108-88-3	Toluene		3.60E-03	3.60E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		2.46E-01	2.46E-01		9.45E-04	9.45E-04
BRWB	100-41-4	Ethyl benzene		2.40E-04	2.40E-04	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.64E-02	1.64E-02		6.30E-05	6.30E-05
BRWB	100-42-5	Styrene		1.80E-03	1.80E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		1.23E-01	1.23E-01		4.73E-04	4.73E-04
BRWB	108-67-8	1,3,5-Trimethylbenzene		5.60E-04	5.60E-04	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		3.82E-02	3.82E-02		1.47E-04	1.47E-04
BRWB	91-20-3	Naphthalene		3.80E-03	3.80E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 2		2.59E-01	2.59E-01		9.98E-04	9.98E-04
UBD	7440-38-2	Arsenic and compounds		4.00E-06	4.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		4.93E-03	4.93E-03		2.37E-05	2.37E-05
UBD	7440-41-7	Beryllium and compounds		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		3.70E-03	3.70E-03		1.78E-05	1.78E-05
UBD	7440-43-9	Cadmium and compounds		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		3.70E-03	3.70E-03		1.78E-05	1.78E-05
UBD	18540-29-9	Chromium VI, chromate and dichromate particulate		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		3.70E-03	3.70E-03		1.78E-05	1.78E-05
UBD	7440-50-8	Copper and compounds		6.00E-06	6.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		7.40E-03	7.40E-03		3.56E-05	3.56E-05
UBD	7439-92-1	Lead and compounds		9.00E-06	9.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		1.11E-02	1.11E-02		5.34E-05	5.34E-05
UBD	7439-97-6	Mercury and compounds		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		3.70E-03	3.70E-03		1.78E-05	1.78E-05
UBD	7439-96-5	Manganese and compounds		6.00E-06	6.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		7.40E-03	7.40E-03		3.56E-05	3.56E-05
UBD	365	Nickel compounds, insoluble		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		3.70E-03	3.70E-03		1.78E-05	1.78E-05
UBD	7782-49-2	Selenium and compounds		1.50E-05	1.50E-05	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		1.85E-02	1.85E-02		8.90E-05	8.90E-05
UBD	7440-66-6	Zinc and compounds		4.00E-06	4.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		4.93E-03	4.93E-03		2.37E-05	2.37E-05
BRWBD	7440-38-2	Arsenic and compounds		4.00E-06	4.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		6.37E-04	6.37E-04		2.45E-06	2.45E-06
BRWBD	7440-41-7	Beryllium and compounds		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		4.77E-04	4.77E-04		1.84E-06	1.84E-06
BRWBD	7440-43-9	Cadmium and compounds		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		4.77E-04	4.77E-04		1.84E-06	1.84E-06
BRWBD	18540-29-9	Chromium VI, chromate and dichromate particulate		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		4.77E-04	4.77E-04		1.84E-06	1.84E-06
BRWBD	7440-50-8	Copper and compounds		6.00E-06	6.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		9.55E-04	9.55E-04		3.67E-06	3.67E-06
BRWBD	7439-92-1	Lead and compounds		9.00E-06	9.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		1.43E-03	1.43E-03		5.51E-06	5.51E-06
BRWBD	7439-97-6	Mercury and compounds		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		4.77E-04	4.77E-04		1.84E-06	1.84E-06
BRWBD	7439-96-5	Manganese and compounds		6.00E-06	6.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		9.55E-04	9.55E-04		3.67E-06	3.67E-06
BRWBD	365	Nickel compounds, insoluble		3.00E-06	3.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		4.77E-04	4.77E-04		1.84E-06	1.84E-06
BRWBD	7782-49-2	Selenium and compounds		1.50E-05	1.50E-05	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		2.39E-03	2.39E-03		9.18E-06	9.18E-06
BRWBD	7440-66-6	Zinc and compounds		4.00E-06	4.00E-06	lb/MMBtu	See Mine TAC and GHG Emissions Sheet, p. 2		6.37E-04	6.37E-04		2.45E-06	2.45E-06
HA	91-57-6	2-Methyl naphthalene		2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.06E-04	2.06E-04		5.65E-07	5.65E-07
HA	56-49-5	3-Methylcholanthrene		1.76E-09	1.76E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.55E-05	1.55E-05		4.24E-08	4.24E-08
HA	57-97-6	7,12-Dimethylbenz[a]anthracene		1.57E-08	1.57E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.37E-04	1.37E-04		3.76E-07	3.76E-07
HA	83-32-9	Acenaphthene		1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.19E-05	1.19E-05		3.27E-08	3.27E-08
HA	208-96-8	Acenaphthylene		1.19E-08	1.19E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.04E-04	1.04E-04		2.85E-07	2.85E-07

HA	75-07-0	Acetaldehyde		1.37E-05	1.37E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.20E-01	1.20E-01		3.29E-04	3.29E-04
HA	107-02-8	Acrolein		4.74E-06	4.74E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		4.16E-02	4.16E-02		1.14E-04	1.14E-04
HA	7664-41-7	Ammonia		1.76E-02	1.76E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.55E+02	1.55E+02		4.24E-01	4.24E-01
HA	120-12-7	Anthracene		1.58E-09	1.58E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.38E-05	1.38E-05		3.79E-08	3.79E-08
HA	7440-38-2	Arsenic and compounds		1.96E-07	1.96E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.72E-03	1.72E-03		4.71E-06	4.71E-06
HA	7440-39-3	Barium and compounds		4.31E-06	4.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.78E-02	3.78E-02		1.04E-04	1.04E-04
HA	56-55-3	Benz[a]anthracene		1.92E-09	1.92E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.68E-05	1.68E-05		4.61E-08	4.61E-08
HA	71-43-2	Benzene		1.10E-05	1.10E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.59E-02	9.59E-02		2.63E-04	2.63E-04
HA	50-32-8	Benzo[a]pyrene		9.61E-10	9.61E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		8.42E-06	8.42E-06		2.31E-08	2.31E-08
HA	205-99-2	Benzo[b]fluoranthene		1.12E-09	1.12E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.79E-06	9.79E-06		2.68E-08	2.68E-08
HA	191-24-2	Benzo[g,h,i]perylene		1.23E-09	1.23E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.07E-05	1.07E-05		2.94E-08	2.94E-08
HA	207-08-9	Benzo[k]fluoranthene		9.71E-10	9.71E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		8.50E-06	8.50E-06		2.33E-08	2.33E-08
HA	7440-41-7	Beryllium and compounds		1.18E-08	1.18E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.03E-04	1.03E-04		2.82E-07	2.82E-07
HA	7440-43-9	Cadmium and compounds		1.08E-06	1.08E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.45E-03	9.45E-03		2.59E-05	2.59E-05
HA	18540-29-9	Chromium VI, chromate and dichromate particulate		1.37E-06	1.37E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.20E-02	1.20E-02		3.29E-05	3.29E-05
HA	218-01-9	Chrysene		1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.19E-05	1.19E-05		3.27E-08	3.27E-08
HA	7440-48-4	Cobalt and compounds		8.24E-08	8.24E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.21E-04	7.21E-04		1.98E-06	1.98E-06
HA	7440-50-8	Copper and compounds		8.33E-07	8.33E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.30E-03	7.30E-03		2.00E-05	2.00E-05
HA	53-70-3	Dibenz[a,h]anthracene		8.99E-10	8.99E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.88E-06	7.88E-06		2.16E-08	2.16E-08
HA	100-41-4	Ethyl benzene		9.31E-06	9.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		8.16E-02	8.16E-02		2.24E-04	2.24E-04
HA	206-44-0	Fluoranthene		1.17E-08	1.17E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.02E-04	1.02E-04		2.80E-07	2.80E-07
HA	86-73-7	Fluorene		4.50E-09	4.50E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.94E-05	3.94E-05		1.08E-07	1.08E-07
HA	50-00-0	Formaldehyde		7.26E-05	7.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		6.36E-01	6.36E-01		1.74E-03	1.74E-03
HA	110-54-3	Hexane		1.76E-03	1.76E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.55E+01	1.55E+01		4.24E-02	4.24E-02
HA	193-39-5	Indeno[1,2,3-cd]pyrene		1.15E-09	1.15E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.00E-05	1.00E-05		2.75E-08	2.75E-08
HA	7439-96-5	Manganese and compounds		3.73E-07	3.73E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.26E-03	3.26E-03		8.94E-06	8.94E-06
HA	7439-97-6	Mercury and compounds		2.55E-07	2.55E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.23E-03	2.23E-03		6.12E-06	6.12E-06
HA	91-20-3	Naphthalene		1.09E-06	1.09E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.58E-03	9.58E-03		2.62E-05	2.62E-05
HA	365	Nickel compounds, insoluble		2.06E-06	2.06E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.80E-02	1.80E-02		4.94E-05	4.94E-05
HA	106-46-7	p-Dichlorobenzene (1,4-dichlorobenzene)		1.18E-06	1.18E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.03E-02	1.03E-02		2.82E-05	2.82E-05
HA	85-01-8	Phenanthrene		3.30E-08	3.30E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.89E-04	2.89E-04		7.93E-07	7.93E-07
HA	115-07-1	Propylene		2.30E-04	2.30E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.02E+00	2.02E+00		5.52E-03	5.52E-03
HA	129-00-0	Pyrene		5.49E-09	5.49E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		4.81E-05	4.81E-05		1.32E-07	1.32E-07
HA	7782-49-2	Selenium and compounds		2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.06E-04	2.06E-04		5.65E-07	5.65E-07
HA	108-88-3	Toluene		3.59E-05	3.59E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.14E-01	3.14E-01		8.61E-04	8.61E-04
HA	7440-62-2	Vanadium (fume or dust)		2.25E-06	2.25E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.98E-02	1.98E-02		5.41E-05	5.41E-05
HA	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		2.67E-05	2.67E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.34E-01	2.34E-01		6.40E-04	6.40E-04
HA	7440-66-6	Zinc and compounds		2.84E-05	2.84E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.49E-01	2.49E-01		6.82E-04	6.82E-04
HPO	91-57-6	2-Methyl naphthalene		2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.06E-04	2.06E-04		5.65E-07	5.65E-07
HPO	56-49-5	3-Methylcholanthrene		1.76E-09	1.76E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.55E-05	1.55E-05		4.24E-08	4.24E-08
HPO	57-97-6	7,12-Dimethylbenz[a]anthracene		1.57E-08	1.57E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.37E-04	1.37E-04		3.76E-07	3.76E-07
HPO	83-32-9	Acenaphthene		1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.19E-05	1.19E-05		3.27E-08	3.27E-08
HPO	208-96-8	Acenaphthylene		1.19E-08	1.19E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.04E-04	1.04E-04		2.85E-07	2.85E-07
HPO	75-07-0	Acetaldehyde		1.37E-05	1.37E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.20E-01	1.20E-01		3.29E-04	3.29E-04
HPO	107-02-8	Acrolein		4.74E-06	4.74E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		4.16E-02	4.16E-02		1.14E-04	1.14E-04
HPO	7664-41-7	Ammonia		1.76E-02	1.76E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.55E+02	1.55E+02		4.24E-01	4.24E-01
HPO	120-12-7	Anthracene		1.58E-09	1.58E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.38E-05	1.38E-05		3.79E-08	3.79E-08
HPO	7440-38-2	Arsenic and compounds		1.96E-07	1.96E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.72E-03	1.72E-03		4.71E-06	4.71E-06
HPO	7440-39-3	Barium and compounds		4.31E-06	4.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.78E-02	3.78E-02		1.04E-04	1.04E-04
HPO	56-55-3	Benz[a]anthracene		1.92E-09	1.92E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.68E-05	1.68E-05		4.61E-08	4.61E-08
HPO	71-43-2	Benzene		1.10E-05	1.10E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.59E-02	9.59E-02		2.63E-04	2.63E-04
HPO	50-32-8	Benzo[a]pyrene		9.61E-10	9.61E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		8.42E-06	8.42E-06		2.31E-08	2.31E-08
HPO	205-99-2	Benzo[b]fluoranthene		1.12E-09	1.12E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.79E-06	9.79E-06		2.68E-08	2.68E-08
HPO	191-24-2	Benzo[g,h,i]perylene		1.23E-09	1.23E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.07E-05	1.07E-05		2.94E-08	2.94E-08
HPO	207-08-9	Benzo[k]fluoranthene		9.71E-10	9.71E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		8.50E-06	8.50E-06		2.33E-08	2.33E-08
HPO	7440-41-7	Beryllium and compounds		1.18E-08	1.18E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.03E-04	1.03E-04		2.82E-07	2.82E-07
HPO	7440-43-9	Cadmium and compounds		1.08E-06	1.08E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.45E-03	9.45E-03		2.59E-05	2.59E-05
HPO	18540-29-9	Chromium VI, chromate and dichromate particulate		1.37E-06	1.37E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.20E-02	1.20E-02		3.29E-05	3.29E-05
HPO	218-01-9	Chrysene		1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.19E-05	1.19E-05		3.27E-08	3.27E-08
HPO	7440-48-4	Cobalt and compounds		8.24E-08	8.24E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.21E-04	7.21E-04		1.98E-06	1.98E-06
HPO	7440-50-8	Copper and compounds		8.33E-07	8.33E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.30E-03	7.30E-03		2.00E-05	2.00E-05
HPO	53-70-3	Dibenz[a,h]anthracene		8.99E-10	8.99E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.88E-06	7.88E-06		2.16E-08	2.16E-08
HPO	100-41-4	Ethyl benzene		9.31E-06	9.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		8.16E-02	8.16E-02		2.24E-04	2.24E-04
HPO	206-44-0	Fluoranthene		1.17E-08	1.17E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.02E-04	1.02E-04		2.80E-07	2.80E-07
HPO	86-73-7	Fluorene		4.50E-09	4.50E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.94E-05	3.94E-05		1.08E-07	1.08E-07
HPO	50-00-0	Formaldehyde		7.26E-05	7.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		6.36E-01	6.36E-01		1.74E-03	1.74E-03
HPO	110-54-3	Hexane		1.76E-03	1.76E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.55E+01	1.55E+01		4.24E-02	4.24E-02
HPO	193-39-5	Indeno[1,2,3-cd]pyrene		1.15E-09	1.15E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.00E-05	1.00E-05		2.75E-08	2.75E-08
HPO	7439-96-5	Manganese and compounds		3.73E-07	3.73E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.26E-03	3.26E-03		8.94E-06	8.94E-06
HPO	7439-97-6	Mercury and compounds		2.55E-07	2.55E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.23E-03	2.23E-03		6.12E-06	6.12E-06
HPO	91-20-3	Naphthalene		1.09E-06	1.09E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.58E-03	9.58E-03		2.62E-05	2.62E-05
HPO	365	Nickel compounds, insoluble		2.06E-06	2.06E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.80E-02	1.80E-02		4.94E-05	4.94E-05
HPO	106-46-7	p-Dichlorobenzene (1,4-dichlorobenzene)		1.18E-06	1.18E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.03E-02	1.03E-02		2.82E-05	2.82E-05
HPO	85-01-8	Phenanthrene		3.30E-08	3.30E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.89E-04	2.89E-04		7.93E-07	7.93E-07
HPO	115-07-1	Propylene		2.30E-04	2.30E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.02E+00	2.02E+00		5.52E-03	5.52E-03
HPO	129-00-0	Pyrene		5.49E-09	5.49E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		4.81E-05	4.81E-05		1.32E-07	1.32E-07
HPO	7782-49-2	Selenium and compounds		2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.06E-04	2.06E-04		5.65E-07	5.65E-07
HPO	108-88-3	Toluene		3.59E-05	3.59E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.14E-01	3.14E-01		8.61E-04	8.61E-04
HPO	7440-62-2	Vanadium (fume or dust)		2.25E-06	2.25E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.98E-02	1.98E-02		5.41E-05	5.41E-05
HPO	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		2.67E-05	2.67E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.34E-01	2.34E-01		6.40E-04	6.40E-04
HPO	7440-66-6	Zinc and compounds		2.84E-05	2.84E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.49E-01	2.49E-01		6.82E-04	6.82E-04
HL	91-57-6	2-Methyl naphthalene		2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		2.06E-04	2.06E-04		5.65E-07	5.65E-07
HL	56-49-5	3-Methylcholanthrene		1.76E-09	1.76E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.55E-05	1.55E-05		4.24E-08	4.24E-08
HL	57-97-6	7,12-Dimethylbenz[a]anthracene		1.57E-08	1.57E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.37E-04	1.37E-04		3.76E-07	3.76E-07
HL	83-32-9	Acenaphthene		1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.19E-05	1.19E-05		3.27E-08	3.27E-08
HL	208-96-8	Acenaphthylene		1.19E-08	1.19E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.04E-04	1.04E-04		2.85E-07	2.85E-07
HL	75-07-0	Acetaldehyde		1.37E-05	1.37E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.20E-01	1.20E-01		3.29E-04	3.29E-04
HL	107-02-8	Acrolein		4.74E-06	4.74E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		4.16E-02	4.16E-02		1.14E-04	1.14E-04
HL	7664-41-7	Ammonia		1.76E-02	1.76E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.55E+02	1.55E+02		4.24E-01	4.24E-01
HL	120-12-7	Anthracene		1.58E-09	1.58E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.38E-05	1.38E-05		3.79E-08	3.79E-08
HL	7440-38-2	Arsenic and compounds		1.96E-07	1.96E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.72E-03	1.72E-03		4.71E-06	4.71E-06
HL	7440-39-3	Barium and compounds		4.31E-06	4.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		3.78E-02	3.78E-02		1.04E-04	1.04E-04
HL	56-55-3	Benz[a]anthracene		1.92E-09	1.92E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.68E-05	1.68E-05		4.61E-08	4.61E-08
HL	71-43-2	Benzene		1.10E-05	1.10E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.59E-02	9.59E-02		2.63E-04	2.63E-04
HL	50-32-8	Benzo[a]pyrene		9.61E-10	9.61E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		8.42E-06	8.42E-06		2.31E-08	2.31E-08
HL	205-99-2	Benzo[b]fluoranthene		1.12E-09	1.12E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.79E-06	9.79E-06		2.68E-08	2.68E-08
HL	191-24-2	Benzo[g,h,i]perylene		1.23E-09	1.23E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.07E-05	1.07E-05		2.94E-08	2.94E-08
HL	207-08-9	Benzo[k]fluoranthene		9.71E-10	9.71E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		8.50E-06	8.50E-06		2.33E-08	2.33E-08
HL	7440-41-7	Beryllium and compounds		1.18E-08	1.18E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.03E-04	1.03E-04		2.82E-07	2.82E-07
HL	7440-43-9	Cadmium and compounds		1.08E-06	1.08E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		9.45E-03	9.45E-03		2.59E-05	2.59E-05
HL	18540-29-9	Chromium VI, chromate and dichromate particulate		1.37E-06	1.37E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.20E-02	1.20E-02		3.29E-05	3.29E-05
HL	218-01-9	Chrysene		1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		1.19E-05	1.19E-05		3.27E-08	3.27E-08
HL	7440-48-4	Cobalt and compounds		8.24E-08	8.24E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.21E-04	7.21E-04		1.98E-06	1.98E-06
HL	7440-50-8	Copper and compounds		8.33E-07	8.33E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.30E-03	7.30E-03		2.00E-05	2.00E-05
HL	53-70-3	Dibenz[a,h]anthracene		8.99E-10	8.99E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2		7.88E-06	7.88E-06		2.16E-08	2.16E-08

HL	100-41-4	Ethyl benzene	9.31E-06	9.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	8.16E-02	8.16E-02	2.24E-04	2.24E-04
HL	206-44-0	Fluoranthene	1.17E-08	1.17E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.02E-04	1.02E-04	2.80E-07	2.80E-07
HL	86-73-7	Fluorene	4.50E-09	4.50E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.94E-05	3.94E-05	1.08E-07	1.08E-07
HL	50-00-0	Formaldehyde	7.26E-05	7.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	6.36E-01	6.36E-01	1.74E-03	1.74E-03
HL	110-54-3	Hexane	1.76E-03	1.76E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.55E+01	1.55E+01	4.24E-02	4.24E-02
HL	193-39-5	Indeno[1,2,3-cd]pyrene	1.15E-09	1.15E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.00E-05	1.00E-05	2.75E-08	2.75E-08
HL	7439-96-5	Manganese and compounds	3.73E-07	3.73E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.26E-03	3.26E-03	8.94E-06	8.94E-06
HL	7439-97-6	Mercury and compounds	2.55E-07	2.55E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.23E-03	2.23E-03	6.12E-06	6.12E-06
HL	91-20-3	Naphthalene	1.09E-06	1.09E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.58E-03	9.58E-03	2.62E-05	2.62E-05
HL	365	Nickel compounds, insoluble	2.06E-06	2.06E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.80E-02	1.80E-02	4.94E-05	4.94E-05
HL	106-46-7	p-Dichlorobenzene (1,4-dichlorobenzene)	1.18E-06	1.18E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-02	1.03E-02	2.82E-05	2.82E-05
HL	85-01-8	Phenanthrene	3.30E-08	3.30E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.89E-04	2.89E-04	7.93E-07	7.93E-07
HL	115-07-1	Propylene	2.30E-04	2.30E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.02E+00	2.02E+00	5.52E-03	5.52E-03
HL	129-00-0	Pyrene	5.49E-09	5.49E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.81E-05	4.81E-05	1.32E-07	1.32E-07
HL	7782-49-2	Selenium and compounds	2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.06E-04	2.06E-04	5.65E-07	5.65E-07
HL	108-88-3	Toluene	3.59E-05	3.59E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.14E-01	3.14E-01	8.61E-04	8.61E-04
HL	7440-62-2	Vanadium (fume or dust)	2.25E-06	2.25E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.98E-02	1.98E-02	5.41E-05	5.41E-05
HL	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.67E-05	2.67E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.34E-01	2.34E-01	6.40E-04	6.40E-04
HL	7440-66-6	Zinc and compounds	2.84E-05	2.84E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.49E-01	2.49E-01	6.82E-04	6.82E-04
HWW	91-57-6	2-Methyl naphthalene	2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.06E-04	2.06E-04	5.65E-07	5.65E-07
HWW	56-49-5	3-Methylcholanthrene	1.76E-09	1.76E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.55E-05	1.55E-05	4.24E-08	4.24E-08
HWW	57-97-6	7,12-Dimethylbenz[a]anthracene	1.57E-08	1.57E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.37E-04	1.37E-04	3.76E-07	3.76E-07
HWW	83-32-9	Acenaphthene	1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.19E-05	1.19E-05	3.27E-08	3.27E-08
HWW	208-96-8	Acenaphthylene	1.19E-08	1.19E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.04E-04	1.04E-04	2.85E-07	2.85E-07
HWW	75-07-0	Acetaldehyde	1.37E-05	1.37E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.20E-01	1.20E-01	3.29E-04	3.29E-04
HWW	107-02-8	Acrolein	4.74E-06	4.74E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.16E-02	4.16E-02	1.14E-04	1.14E-04
HWW	7664-41-7	Ammonia	1.76E-02	1.76E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.55E+02	1.55E+02	4.24E-01	4.24E-01
HWW	120-12-7	Anthracene	1.58E-09	1.58E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.38E-05	1.38E-05	3.79E-08	3.79E-08
HWW	7440-38-2	Arsenic and compounds	1.96E-07	1.96E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.72E-03	1.72E-03	4.71E-06	4.71E-06
HWW	7440-39-3	Barium and compounds	4.31E-06	4.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.78E-02	3.78E-02	1.04E-04	1.04E-04
HWW	56-55-3	Benz[a]anthracene	1.92E-09	1.92E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.68E-05	1.68E-05	4.61E-08	4.61E-08
HWW	71-43-2	Benzene	1.10E-05	1.10E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.59E-02	9.59E-02	2.63E-04	2.63E-04
HWW	50-32-8	Benzo[a]pyrene	9.61E-10	9.61E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	8.42E-06	8.42E-06	2.31E-08	2.31E-08
HWW	205-99-2	Benzo[b]fluoranthene	1.12E-09	1.12E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.79E-06	9.79E-06	2.68E-08	2.68E-08
HWW	191-24-2	Benzo[g,h,i]perylene	1.23E-09	1.23E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.07E-05	1.07E-05	2.94E-08	2.94E-08
HWW	207-08-9	Benzo[k]fluoranthene	9.71E-10	9.71E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	8.50E-06	8.50E-06	2.33E-08	2.33E-08
HWW	7440-41-7	Beryllium and compounds	1.18E-08	1.18E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-04	1.03E-04	2.82E-07	2.82E-07
HWW	7440-43-9	Cadmium and compounds	1.08E-06	1.08E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.45E-03	9.45E-03	2.59E-05	2.59E-05
HWW	18540-29-9	Chromium VI, chromate and dichromate particulate	1.37E-06	1.37E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.20E-02	1.20E-02	3.29E-05	3.29E-05
HWW	218-01-9	Chrysene	1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.19E-05	1.19E-05	3.27E-08	3.27E-08
HWW	7440-48-4	Cobalt and compounds	8.24E-08	8.24E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	7.21E-04	7.21E-04	1.98E-06	1.98E-06
HWW	7440-50-8	Copper and compounds	8.33E-07	8.33E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	7.30E-03	7.30E-03	2.00E-05	2.00E-05
HWW	53-70-3	Dibenz[a,h]anthracene	8.99E-10	8.99E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	7.88E-06	7.88E-06	2.16E-08	2.16E-08
HWW	100-41-4	Ethyl benzene	9.31E-06	9.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	8.16E-02	8.16E-02	2.24E-04	2.24E-04
HWW	206-44-0	Fluoranthene	1.17E-08	1.17E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.02E-04	1.02E-04	2.80E-07	2.80E-07
HWW	86-73-7	Fluorene	4.50E-09	4.50E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.94E-05	3.94E-05	1.08E-07	1.08E-07
HWW	50-00-0	Formaldehyde	7.26E-05	7.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	6.36E-01	6.36E-01	1.74E-03	1.74E-03
HWW	110-54-3	Hexane	1.76E-03	1.76E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.55E+01	1.55E+01	4.24E-02	4.24E-02
HWW	193-39-5	Indeno[1,2,3-cd]pyrene	1.15E-09	1.15E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.00E-05	1.00E-05	2.75E-08	2.75E-08
HWW	7439-96-5	Manganese and compounds	3.73E-07	3.73E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.26E-03	3.26E-03	8.94E-06	8.94E-06
HWW	7439-97-6	Mercury and compounds	2.55E-07	2.55E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.23E-03	2.23E-03	6.12E-06	6.12E-06
HWW	91-20-3	Naphthalene	1.09E-06	1.09E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.58E-03	9.58E-03	2.62E-05	2.62E-05
HWW	365	Nickel compounds, insoluble	2.06E-06	2.06E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.80E-02	1.80E-02	4.94E-05	4.94E-05
HWW	106-46-7	p-Dichlorobenzene (1,4-dichlorobenzene)	1.18E-06	1.18E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-02	1.03E-02	2.82E-05	2.82E-05
HWW	85-01-8	Phenanthrene	3.30E-08	3.30E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.89E-04	2.89E-04	7.93E-07	7.93E-07
HWW	115-07-1	Propylene	2.30E-04	2.30E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.02E+00	2.02E+00	5.52E-03	5.52E-03
HWW	129-00-0	Pyrene	5.49E-09	5.49E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.81E-05	4.81E-05	1.32E-07	1.32E-07
HWW	7782-49-2	Selenium and compounds	2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.06E-04	2.06E-04	5.65E-07	5.65E-07
HWW	108-88-3	Toluene	3.59E-05	3.59E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.14E-01	3.14E-01	8.61E-04	8.61E-04
HWW	7440-62-2	Vanadium (fume or dust)	2.25E-06	2.25E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.98E-02	1.98E-02	5.41E-05	5.41E-05
HWW	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.67E-05	2.67E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.34E-01	2.34E-01	6.40E-04	6.40E-04
HWW	7440-66-6	Zinc and compounds	2.84E-05	2.84E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.49E-01	2.49E-01	6.82E-04	6.82E-04
HTW	91-57-6	2-Methyl naphthalene	2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.12E-04	4.12E-04	1.13E-06	1.13E-06
HTW	56-49-5	3-Methylcholanthrene	1.76E-09	1.76E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.09E-05	3.09E-05	8.47E-08	8.47E-08
HTW	57-97-6	7,12-Dimethylbenz[a]anthracene	1.57E-08	1.57E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.75E-04	2.75E-04	7.53E-07	7.53E-07
HTW	83-32-9	Acenaphthene	1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.39E-05	2.39E-05	6.54E-08	6.54E-08
HTW	208-96-8	Acenaphthylene	1.19E-08	1.19E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.08E-04	2.08E-04	5.69E-07	5.69E-07
HTW	75-07-0	Acetaldehyde	1.37E-05	1.37E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.40E-01	2.40E-01	6.58E-04	6.58E-04
HTW	107-02-8	Acrolein	4.74E-06	4.74E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	8.31E-02	8.31E-02	2.28E-04	2.28E-04
HTW	7664-41-7	Ammonia	1.76E-02	1.76E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.09E+02	3.09E+02	8.47E-01	8.47E-01
HTW	120-12-7	Anthracene	1.58E-09	1.58E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.77E-05	2.77E-05	7.58E-08	7.58E-08
HTW	7440-38-2	Arsenic and compounds	1.96E-07	1.96E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.44E-03	3.44E-03	9.41E-06	9.41E-06
HTW	7440-39-3	Barium and compounds	4.31E-06	4.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	7.56E-02	7.56E-02	2.07E-04	2.07E-04
HTW	56-55-3	Benz[a]anthracene	1.92E-09	1.92E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.37E-05	3.37E-05	9.22E-08	9.22E-08
HTW	71-43-2	Benzene	1.10E-05	1.10E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.92E-01	1.92E-01	5.26E-04	5.26E-04
HTW	50-32-8	Benzo[a]pyrene	9.61E-10	9.61E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.68E-05	1.68E-05	4.61E-08	4.61E-08
HTW	205-99-2	Benzo[b]fluoranthene	1.12E-09	1.12E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.96E-05	1.96E-05	5.36E-08	5.36E-08
HTW	191-24-2	Benzo[g,h,i]perylene	1.23E-09	1.23E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.15E-05	2.15E-05	5.88E-08	5.88E-08
HTW	207-08-9	Benzo[k]fluoranthene	9.71E-10	9.71E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.70E-05	1.70E-05	4.66E-08	4.66E-08
HTW	7440-41-7	Beryllium and compounds	1.18E-08	1.18E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.06E-04	2.06E-04	5.65E-07	5.65E-07
HTW	7440-43-9	Cadmium and compounds	1.08E-06	1.08E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.89E-02	1.89E-02	5.18E-05	5.18E-05
HTW	18540-29-9	Chromium VI, chromate and dichromate particulate	1.37E-06	1.37E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.40E-02	2.40E-02	6.59E-05	6.59E-05
HTW	218-01-9	Chrysene	1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.39E-05	2.39E-05	6.54E-08	6.54E-08
HTW	7440-48-4	Cobalt and compounds	8.24E-08	8.24E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.44E-03	1.44E-03	3.95E-06	3.95E-06
HTW	7440-50-8	Copper and compounds	8.33E-07	8.33E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.46E-02	1.46E-02	4.00E-05	4.00E-05
HTW	53-70-3	Dibenz[a,h]anthracene	8.99E-10	8.99E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.58E-05	1.58E-05	4.32E-08	4.32E-08
HTW	100-41-4	Ethyl benzene	9.31E-06	9.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.63E-01	1.63E-01	4.47E-04	4.47E-04
HTW	206-44-0	Fluoranthene	1.17E-08	1.17E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.04E-04	2.04E-04	5.60E-07	5.60E-07
HTW	86-73-7	Fluorene	4.50E-09	4.50E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	7.88E-05	7.88E-05	2.16E-07	2.16E-07
HTW	50-00-0	Formaldehyde	7.26E-05	7.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.27E+00	1.27E+00	3.48E-03	3.48E-03
HTW	110-54-3	Hexane	1.76E-03	1.76E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.09E+01	3.09E+01	8.47E-02	8.47E-02
HTW	193-39-5	Indeno[1,2,3-cd]pyrene	1.15E-09	1.15E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.01E-05	2.01E-05	5.51E-08	5.51E-08
HTW	7439-96-5	Manganese and compounds	3.73E-07	3.73E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	6.53E-03	6.53E-03	1.79E-05	1.79E-05
HTW	7439-97-6	Mercury and compounds	2.55E-07	2.55E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.47E-03	4.47E-03	1.22E-05	1.22E-05
HTW	91-20-3	Naphthalene	1.09E-06	1.09E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.92E-02	1.92E-02	5.25E-05	5.25E-05
HTW	365	Nickel compounds, insoluble	2.06E-06	2.06E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.61E-02	3.61E-02	9.88E-05	9.88E-05
HTW	106-46-7	p-Dichlorobenzene (1,4-dichlorobenzene)	1.18E-06	1.18E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.06E-02	2.06E-02	5.65E-05	5.65E-05
HTW	85-01-8	Phenanthrene	3.30E-08	3.30E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	5.79E-04	5.79E-04	1.59E-06	1.59E-06
HTW	115-07-1	Propylene	2.30E-04	2.30E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.03E+00	4.03E+00	1.10E-02	1.10E-02
HTW	129-00-0	Pyrene	5.49E-09	5.49E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.62E-05	9.62E-05	2.64E-07	2.64E-07
HTW	7782-49-2	Selenium and compounds	2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.12E-04	4.12E-04	1.13E-06	1.13E-06
HTW	108-88-3	Toluene	3.59E-05	3.59E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	6.29E-01	6.29E-01	1.72E-03	1.72E-03
HTW	7440-62-2	Vanadium (fume or dust)	2.25E-06	2.25E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.95E-02	3.95E-02	1.08E-04	1.08E-04
HTW	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.67E-05	2.67E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.67E-01	4.67E-01	1.28E-03	1.28E-03
HTW	7440-66-6	Zinc and compounds	2.84E-05	2.84E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.98E-01	4.98E-01	1.36E-03	1.36E-03

HMO	91-57-6	2-Methyl naphthalene	2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.06E-04	2.06E-04	5.65E-07	5.65E-07
HMO	56-49-5	3-Methylcholanthrene	1.76E-09	1.76E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.55E-05	1.55E-05	4.24E-08	4.24E-08
HMO	57-97-6	7,12-Dimethylbenz[a]anthracene	1.57E-08	1.57E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.37E-04	1.37E-04	3.76E-07	3.76E-07
HMO	83-32-9	Acenaphthene	1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.19E-05	1.19E-05	3.27E-08	3.27E-08
HMO	208-96-8	Acenaphthylene	1.19E-08	1.19E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.04E-04	1.04E-04	2.85E-07	2.85E-07
HMO	75-07-0	Acetaldehyde	1.37E-05	1.37E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.20E-01	1.20E-01	3.29E-04	3.29E-04
HMO	107-02-8	Acrolein	4.74E-06	4.74E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.16E-02	4.16E-02	1.14E-04	1.14E-04
HMO	7664-41-7	Ammonia	1.76E-02	1.76E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.55E+02	1.55E+02	4.24E-01	4.24E-01
HMO	120-12-7	Anthracene	1.58E-09	1.58E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.38E-05	1.38E-05	3.79E-08	3.79E-08
HMO	7440-38-2	Arsenic and compounds	1.96E-07	1.96E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.72E-03	1.72E-03	4.71E-06	4.71E-06
HMO	7440-39-3	Barium and compounds	4.31E-06	4.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.78E-02	3.78E-02	1.04E-04	1.04E-04
HMO	56-55-3	Benz[a]anthracene	1.92E-09	1.92E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.68E-05	1.68E-05	4.61E-08	4.61E-08
HMO	71-43-2	Benzene	1.10E-05	1.10E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.59E-02	9.59E-02	2.63E-04	2.63E-04
HMO	50-32-8	Benzo[a]pyrene	9.61E-10	9.61E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	8.42E-06	8.42E-06	2.31E-08	2.31E-08
HMO	205-99-2	Benzo[b]fluoranthene	1.12E-09	1.12E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.79E-06	9.79E-06	2.68E-08	2.68E-08
HMO	191-24-2	Benzo[g,h,i]perylene	1.23E-09	1.23E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.07E-05	1.07E-05	2.94E-08	2.94E-08
HMO	207-08-9	Benzo[k]fluoranthene	9.71E-10	9.71E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	8.50E-06	8.50E-06	2.33E-08	2.33E-08
HMO	7440-41-7	Beryllium and compounds	1.18E-08	1.18E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-04	1.03E-04	2.82E-07	2.82E-07
HMO	7440-43-9	Cadmium and compounds	1.08E-06	1.08E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.45E-03	9.45E-03	2.59E-05	2.59E-05
HMO	18540-29-9	Chromium VI, chromate and dichromate particulate	1.37E-06	1.37E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.20E-02	1.20E-02	3.29E-05	3.29E-05
HMO	218-01-9	Chrysene	1.36E-09	1.36E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.19E-05	1.19E-05	3.27E-08	3.27E-08
HMO	7440-48-4	Cobalt and compounds	8.24E-08	8.24E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	7.21E-04	7.21E-04	1.98E-06	1.98E-06
HMO	7440-50-8	Copper and compounds	8.33E-07	8.33E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	7.30E-03	7.30E-03	2.00E-05	2.00E-05
HMO	53-70-3	Dibenz[a,h]anthracene	8.99E-10	8.99E-10	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	7.88E-06	7.88E-06	2.16E-08	2.16E-08
HMO	100-41-4	Ethyl benzene	9.31E-06	9.31E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	8.16E-02	8.16E-02	2.24E-04	2.24E-04
HMO	206-44-0	Fluoranthene	1.17E-08	1.17E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.02E-04	1.02E-04	2.80E-07	2.80E-07
HMO	86-73-7	Fluorene	4.50E-09	4.50E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.94E-05	3.94E-05	1.08E-07	1.08E-07
HMO	50-00-0	Formaldehyde	7.26E-05	7.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	6.36E-01	6.36E-01	1.74E-03	1.74E-03
HMO	110-54-3	Hexane	1.76E-03	1.76E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.55E+01	1.55E+01	4.24E-02	4.24E-02
HMO	193-39-5	Indeno[1,2,3-cd]pyrene	1.15E-09	1.15E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.00E-05	1.00E-05	2.75E-08	2.75E-08
HMO	7439-96-5	Manganese and compounds	3.73E-07	3.73E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.26E-03	3.26E-03	8.94E-06	8.94E-06
HMO	7439-97-6	Mercury and compounds	2.55E-07	2.55E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.23E-03	2.23E-03	6.12E-06	6.12E-06
HMO	91-20-3	Naphthalene	1.09E-06	1.09E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	9.58E-03	9.58E-03	2.62E-05	2.62E-05
HMO	365	Nickel compounds, insoluble	2.06E-06	2.06E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.80E-02	1.80E-02	4.94E-05	4.94E-05
HMO	106-46-7	p-Dichlorobenzene (1,4-dichlorobenzene)	1.18E-06	1.18E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.03E-02	1.03E-02	2.82E-05	2.82E-05
HMO	85-01-8	Phenanthrene	3.30E-08	3.30E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.89E-04	2.89E-04	7.93E-07	7.93E-07
HMO	115-07-1	Propylene	2.30E-04	2.30E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.02E+00	2.02E+00	5.52E-03	5.52E-03
HMO	129-00-0	Pyrene	5.49E-09	5.49E-09	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	4.81E-05	4.81E-05	1.32E-07	1.32E-07
HMO	7782-49-2	Selenium and compounds	2.35E-08	2.35E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.06E-04	2.06E-04	5.65E-07	5.65E-07
HMO	108-88-3	Toluene	3.59E-05	3.59E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	3.14E-01	3.14E-01	8.61E-04	8.61E-04
HMO	7440-62-2	Vanadium (fume or dust)	2.25E-06	2.25E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	1.98E-02	1.98E-02	5.41E-05	5.41E-05
HMO	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.67E-05	2.67E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.34E-01	2.34E-01	6.40E-04	6.40E-04
HMO	7440-66-6	Zinc and compounds	2.84E-05	2.84E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 2	2.49E-01	2.49E-01	6.82E-04	6.82E-04
CKD	7440-38-2	Arsenic and compounds	4.63E-05	4.63E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	8.11E-02	8.11E-02	2.22E-04	2.22E-04
CKD	7440-41-7	Beryllium and compounds	3.27E-07	3.27E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	5.73E-04	5.73E-04	1.57E-06	1.57E-06
CKD	7440-43-9	Cadmium and compounds	6.00E-08	6.00E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.05E-04	1.05E-04	2.88E-07	2.88E-07
CKD	7440-48-4	Cobalt and compounds	4.26E-07	4.26E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	7.46E-04	7.46E-04	2.04E-06	2.04E-06
CKD	18540-29-9	Chromium VI, chromate and dichromate particulate	8.36E-06	8.36E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.46E-02	1.46E-02	4.01E-05	4.01E-05
CKD	7439-96-5	Manganese and compounds	2.28E-05	2.28E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.99E-02	3.99E-02	1.09E-04	1.09E-04
CKD	365	Nickel compounds, insoluble	1.39E-06	1.39E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.43E-03	2.43E-03	6.65E-06	6.65E-06
CKD	7439-92-1	Lead and compounds	1.94E-06	1.94E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.39E-03	3.39E-03	9.29E-06	9.29E-06
CKD	7440-36-0	Antimony and compounds	1.24E-05	1.24E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.18E-02	2.18E-02	5.97E-05	5.97E-05
CKD	7440-39-3	Barium and compounds	1.98E-04	1.98E-04	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.48E-01	3.48E-01	9.52E-04	9.52E-04
CKD	7440-50-8	Copper and compounds	5.34E-06	5.34E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	9.36E-03	9.36E-03	2.56E-05	2.56E-05
CKD	1313-27-5	Molybdenum trioxide	2.64E-06	2.64E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	4.62E-03	4.62E-03	1.27E-05	1.27E-05
CKD	7440-62-2	Vanadium (fume or dust)	4.82E-06	4.82E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	8.44E-03	8.44E-03	2.31E-05	2.31E-05
CKD	7440-66-6	Zinc and compounds	4.93E-06	4.93E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	8.64E-03	8.64E-03	2.37E-05	2.37E-05
CKD	7439-97-6	Mercury and compounds	2.37E-04	5.19E-04	lb/hr	See Process TAC and GHG Emissions Sheet, p. 11	2.08E+00	2.08E+00	1.25E-02	1.25E-02
CKD	7440-22-4	Silver and compounds	2.80E-06	2.80E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	4.91E-03	4.91E-03	1.34E-05	1.34E-05
CKD	7631-86-9	Silica, crystalline (respirable)	1.91E-01	1.91E-01	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.34E+02	3.34E+02	9.16E-01	9.16E-01
EW	7439-97-6	Mercury and compounds	5.77E-04	1.26E-03	lb/hr	See Process TAC and GHG Emissions Sheet, p. 11	5.05E+00	5.05E+00	3.03E-02	3.03E-02
EW	74-90-8	Cyanide, hydrogen	4.57E-03	4.57E-03	lb/hr	See HCN Monthly Sheet	4.00E+01	4.00E+01	1.10E-01	1.10E-01
MR	7439-97-6	Mercury and compounds	2.68E-05	1.96E-04	lb/hr	See Process TAC and GHG Emissions Sheet, p. 11	2.35E-01	2.35E-01	4.70E-03	4.70E-03
MFP	7440-38-2	Arsenic and compounds	1.69E-04	3.37E-04	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	7.88E-02	7.88E-02	1.52E-03	1.52E-03
MFP	7440-41-7	Beryllium and compounds	1.19E-06	2.38E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	5.57E-04	5.57E-04	1.07E-05	1.07E-05
MFP	7440-43-9	Cadmium and compounds	2.19E-07	4.37E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.02E-04	1.02E-04	1.97E-06	1.97E-06
MFP	7440-48-4	Cobalt and compounds	1.55E-06	3.10E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	7.26E-04	7.26E-04	1.40E-05	1.40E-05
MFP	18540-29-9	Chromium VI, chromate and dichromate particulate	3.05E-05	6.09E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.42E-02	1.42E-02	2.74E-04	2.74E-04
MFP	7439-96-5	Manganese and compounds	8.29E-05	1.66E-04	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.88E-02	3.88E-02	7.46E-04	7.46E-04
MFP	365	Nickel compounds, insoluble	5.05E-06	1.01E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.36E-03	2.36E-03	4.54E-05	4.54E-05
MFP	7439-92-1	Lead and compounds	7.05E-06	1.41E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.30E-03	3.30E-03	6.34E-05	6.34E-05
MFP	7440-36-0	Antimony and compounds	4.53E-05	9.06E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.12E-02	2.12E-02	4.07E-04	4.07E-04
MFP	7440-39-3	Barium and compounds	7.23E-04	1.45E-03	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.38E-01	3.38E-01	6.50E-03	6.50E-03
MFP	7440-50-8	Copper and compounds	1.95E-05	3.89E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	9.11E-03	9.11E-03	1.75E-04	1.75E-04
MFP	1313-27-5	Molybdenum trioxide	9.61E-06	1.92E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	4.49E-03	4.49E-03	8.64E-05	8.64E-05
MFP	7440-62-2	Vanadium (fume or dust)	1.75E-05	3.51E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	8.21E-03	8.21E-03	1.58E-04	1.58E-04
MFP	7440-66-6	Zinc and compounds	1.80E-05	3.59E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	8.41E-03	8.41E-03	1.62E-04	1.62E-04
MFP	7440-22-4	Silver and compounds	1.02E-05	2.04E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	4.78E-03	4.78E-03	9.18E-05	9.18E-05
MFHG	7439-97-6	Mercury and compounds	1.33E-03	1.73E-03	lb/hr	See Process TAC and GHG Emissions Sheet, p. 11	1.04E+00	1.04E+00	4.14E-02	4.14E-02
MFP	7631-86-9	Silica, crystalline (respirable)	6.95E-01	1.39E+00	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.25E+02	3.25E+02	6.25E+00	6.25E+00
UFD	7440-36-0	Antimony and compounds	4.35E-08	4.35E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	1.27E-02	1.27E-02	6.08E-05	6.08E-05
UFD	7440-38-2	Arsenic and compounds	1.58E-07	1.58E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	4.59E-02	4.59E-02	2.21E-04	2.21E-04
UFD	7440-41-7	Beryllium and compounds	1.20E-09	1.20E-09	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	3.50E-04	3.50E-04	1.68E-06	1.68E-06
UFD	7440-43-9	Cadmium and compounds	2.07E-10	2.07E-10	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	6.03E-05	6.03E-05	2.90E-07	2.90E-07
UFD	18540-29-9	Chromium VI, chromate and dichromate particulate	2.82E-08	2.82E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	8.22E-03	8.22E-03	3.95E-05	3.95E-05
UFD	7440-48-4	Cobalt and compounds	1.61E-09	1.61E-09	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	4.68E-04	4.68E-04	2.25E-06	2.25E-06
UFD	7439-92-1	Lead and compounds	6.84E-09	6.84E-09	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	1.99E-03	1.99E-03	9.58E-06	9.58E-06
UFD	7439-96-5	Manganese and compounds	8.05E-08	8.05E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	2.34E-02	2.34E-02	1.13E-04	1.13E-04
UFD	7439-97-6	Mercury and compounds	2.33E-09	2.33E-09	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	6.78E-04	6.78E-04	3.26E-06	3.26E-06
UFD	365	Nickel compounds, insoluble	4.75E-09	4.75E-09	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	1.38E-03	1.38E-03	6.65E-06	6.65E-06
UFD	7631-86-9	Silica, crystalline (respirable)	3.29E-04	3.29E-04	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	9.59E+01	9.59E+01	4.61E-01	4.61E-01
UFD	7440-39-3	Barium and compounds	6.90E-07	6.90E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	2.01E-01	2.01E-01	9.65E-04	9.65E-04
UFD	7440-50-8	Copper and compounds	1.75E-08	1.75E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	5.10E-03	5.10E-03	2.45E-05	2.45E-05
UFD	7440-62-2	Vanadium (fume or dust)	1.70E-08	1.70E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	4.95E-03	4.95E-03	2.38E-05	2.38E-05
UFD	7440-66-6	Zinc and compounds	1.72E-08	1.72E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	5.00E-03	5.00E-03	2.40E-05	2.40E-05
UFD	7440-22-4	Silver and compounds	8.84E-09	8.84E-09	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	2.57E-03	2.57E-03	1.24E-05	1.24E-05
UFD	1313-27-5	Molybdenum trioxide	8.84E-09	8.84E-09	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	2.57E-03	2.57E-03	1.24E-05	1.24E-05
AFD	7440-36-0	Antimony and compounds	5.81E-07	8.12E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	1.44E-01	1.44E-01	7.71E-04	7.71E-04
AFD	7440-38-2	Arsenic and compounds	1.79E-06	2.47E-06	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	4.42E-01	4.42E-01	2.34E-03	2.34E-03
AFD	7440-41-7	Beryllium and compounds	2.07E-08	2.94E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	5.12E-03	5.12E-03	2.79E-05	2.79E-05
AFD	7440-43-9	Cadmium and compounds	2.57E-09	3.56E-09	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	6.34E-04	6.34E-04	3.39E-06	3.39E-06
AFD	18540-29-9	Chromium VI, chromate and dichromate particulate	2.97E-07	4.06E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	7.33E-02	7.33E-02	3.86E-04	3.86E-04
AFD	7440-48-4	Cobalt and compounds	3.09E-08	4.41E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	7.64E-03	7.64E-03	4.19E-05	4.19E-05
AFD	7439-92-1	Lead and compounds	9.80E-08	1.38E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	2.42E-02	2.42E-02	1.31E-04	1.31E-04
AFD	7439-96-5	Manganese and compounds	1.15E-06	1.62E-06	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	2.84E-01	2.84E-01	1.53E-03	1.53E-03

AFD	7439-97-6	Mercury and compounds	2.95E-08	4.11E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	7.29E-03	7.29E-03	3.90E-05	3.90E-05
AFD	365	Nickel compounds, insoluble	5.59E-08	7.74E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	1.38E-02	1.38E-02	7.35E-05	7.35E-05
AFD	7631-86-9	Silica, crystalline (respirable)	4.01E-03	5.58E-03	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	9.90E+02	9.90E+02	5.30E+00	5.30E+00
AFD	7440-39-3	Barium and compounds	8.90E-06	1.24E-05	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	2.20E+00	2.20E+00	1.18E-02	1.18E-02
AFD	7440-50-8	Copper and compounds	1.42E-07	1.89E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	3.50E-02	3.50E-02	1.79E-04	1.79E-04
AFD	7440-62-2	Vanadium (fume or dust)	2.41E-07	3.38E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	5.95E-02	5.95E-02	3.21E-04	3.21E-04
AFD	7440-66-6	Zinc and compounds	2.24E-07	3.13E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	5.54E-02	5.54E-02	2.97E-04	2.97E-04
AFD	7440-22-4	Silver and compounds	4.17E-08	5.08E-08	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	1.03E-02	1.03E-02	4.83E-05	4.83E-05
AFD	1313-27-5	Molybdenum trioxide	8.78E-08	1.20E-07	lb/ton	See Mine TAC and GHG Emissions Sheet, p. 1	2.17E-02	2.17E-02	1.14E-04	1.14E-04
TSF	74-90-8	Cyanide, hydrogen	1.44E-01	1.83E-01	lb/hr	See HCN Monthly Sheet	1.26E+03	1.26E+03	4.40E+00	4.40E+00
POND	74-90-8	Cyanide, hydrogen	2.95E-02	4.36E-02	lb/hr	See HCN Monthly Sheet	2.58E+02	2.58E+02	1.05E+00	1.05E+00
LEACH1	74-90-8	Cyanide, hydrogen	4.78E-02	4.78E-02	lb/hr	See HCN Monthly Sheet	4.19E+02	4.19E+02	1.15E+00	1.15E+00
LEACH2	74-90-8	Cyanide, hydrogen	4.78E-02	4.78E-02	lb/hr	See HCN Monthly Sheet	4.19E+02	4.19E+02	1.15E+00	1.15E+00
CILTANK1	74-90-8	Cyanide, hydrogen	2.39E-02	2.39E-02	lb/hr	See HCN Monthly Sheet	2.09E+02	2.09E+02	5.74E-01	5.74E-01
CILTANK2	74-90-8	Cyanide, hydrogen	2.39E-02	2.39E-02	lb/hr	See HCN Monthly Sheet	2.09E+02	2.09E+02	5.74E-01	5.74E-01
CILTANK3	74-90-8	Cyanide, hydrogen	2.39E-02	2.39E-02	lb/hr	See HCN Monthly Sheet	2.09E+02	2.09E+02	5.74E-01	5.74E-01
CILTANK4	74-90-8	Cyanide, hydrogen	2.39E-02	2.39E-02	lb/hr	See HCN Monthly Sheet	2.09E+02	2.09E+02	5.74E-01	5.74E-01
CILTANK5	74-90-8	Cyanide, hydrogen	2.39E-02	2.39E-02	lb/hr	See HCN Monthly Sheet	2.09E+02	2.09E+02	5.74E-01	5.74E-01
CILTANK6	74-90-8	Cyanide, hydrogen	2.39E-02	2.39E-02	lb/hr	See HCN Monthly Sheet	2.09E+02	2.09E+02	5.74E-01	5.74E-01
CILTANK7	74-90-8	Cyanide, hydrogen	2.39E-02	2.39E-02	lb/hr	See HCN Monthly Sheet	2.09E+02	2.09E+02	5.74E-01	5.74E-01
CEM1	7440-38-2	Arsenic and compounds	1.42E-07	1.42E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	2.67E-03	2.67E-03	1.14E-05	1.14E-05
CEM1	7440-41-7	Beryllium and compounds	1.29E-08	1.29E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	2.43E-04	2.43E-04	1.04E-06	1.04E-06
CEM1	7440-43-9	Cadmium and compounds	4.06E-09	4.06E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	7.61E-05	7.61E-05	3.25E-07	3.25E-07
CEM1	18540-29-9	Chromium VI, chromate and dichromate particulate	1.94E-07	1.94E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	3.64E-03	3.64E-03	1.55E-05	1.55E-05
CEM1	7439-92-1	Lead and compounds	8.15E-08	8.15E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.53E-03	1.53E-03	6.52E-06	6.52E-06
CEM1	7439-96-5	Manganese and compounds	1.36E-07	1.36E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	2.55E-03	2.55E-03	1.09E-05	1.09E-05
CEM1	365	Nickel compounds, insoluble	3.52E-07	3.52E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	6.60E-03	6.60E-03	2.82E-05	2.82E-05
CEM1	12185-10-3	Phosphorus, white	6.94E-07	6.94E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.30E-02	1.30E-02	5.55E-05	5.55E-05
CEM1	7782-49-2	Selenium and compounds	1.00E-08	1.00E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.88E-04	1.88E-04	8.03E-07	8.03E-07
CEM1	7631-86-9	Silica, crystalline (respirable)	6.80E-06	6.80E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.27E-01	1.27E-01	5.44E-04	5.44E-04
CEM2	7440-38-2	Arsenic and compounds	1.42E-07	1.42E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	2.67E-03	2.67E-03	1.14E-05	1.14E-05
CEM2	7440-41-7	Beryllium and compounds	1.29E-08	1.29E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	2.43E-04	2.43E-04	1.04E-06	1.04E-06
CEM2	7440-43-9	Cadmium and compounds	4.06E-09	4.06E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	7.61E-05	7.61E-05	3.25E-07	3.25E-07
CEM2	18540-29-9	Chromium VI, chromate and dichromate particulate	1.94E-07	1.94E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	3.64E-03	3.64E-03	1.55E-05	1.55E-05
CEM2	7439-92-1	Lead and compounds	8.15E-08	8.15E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.53E-03	1.53E-03	6.52E-06	6.52E-06
CEM2	7439-96-5	Manganese and compounds	1.36E-07	1.36E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	2.55E-03	2.55E-03	1.09E-05	1.09E-05
CEM2	365	Nickel compounds, insoluble	3.52E-07	3.52E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	6.60E-03	6.60E-03	2.82E-05	2.82E-05
CEM2	12185-10-3	Phosphorus, white	6.94E-07	6.94E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.30E-02	1.30E-02	5.55E-05	5.55E-05
CEM2	7782-49-2	Selenium and compounds	1.00E-08	1.00E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.88E-04	1.88E-04	8.03E-07	8.03E-07
CEM2	7631-86-9	Silica, crystalline (respirable)	6.80E-06	6.80E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.27E-01	1.27E-01	5.44E-04	5.44E-04
CEM3	7440-38-2	Arsenic and compounds	9.84E-07	9.84E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.45E-01	2.45E-01	1.11E-03	1.11E-03
CEM3	7440-41-7	Beryllium and compounds	1.26E-08	1.26E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.14E-03	3.14E-03	1.42E-05	1.42E-05
CEM3	7440-43-9	Cadmium and compounds	1.45E-09	1.45E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.61E-04	3.61E-04	1.63E-06	1.63E-06
CEM3	7440-48-4	Cobalt and compounds	1.92E-08	1.92E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	4.78E-03	4.78E-03	2.16E-05	2.16E-05
CEM3	18540-29-9	Chromium VI, chromate and dichromate particulate	1.59E-07	1.59E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.96E-02	3.96E-02	1.79E-04	1.79E-04
CEM3	7439-97-6	Mercury and compounds	1.68E-08	1.68E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	4.17E-03	4.17E-03	1.89E-05	1.89E-05
CEM3	7439-96-5	Manganese and compounds	6.74E-07	6.74E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.68E-01	1.68E-01	7.58E-04	7.58E-04
CEM3	365	Nickel compounds, insoluble	3.11E-08	3.11E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	7.75E-03	7.75E-03	3.50E-05	3.50E-05
CEM3	7439-92-1	Lead and compounds	5.74E-08	5.74E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.43E-02	1.43E-02	6.46E-05	6.46E-05
CEM3	7440-36-0	Antimony and compounds	3.35E-07	3.35E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	8.34E-02	8.34E-02	3.77E-04	3.77E-04
CEM3	7440-39-3	Barium and compounds	5.08E-06	5.08E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.27E+00	1.27E+00	5.72E-03	5.72E-03
CEM3	7440-50-8	Copper and compounds	6.82E-08	6.82E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.70E-02	1.70E-02	7.67E-05	7.67E-05
CEM3	7440-62-2	Vanadium (fume or dust)	1.41E-07	1.41E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.50E-02	3.50E-02	1.58E-04	1.58E-04
CEM3	7440-66-6	Zinc and compounds	1.28E-07	1.28E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.20E-02	3.20E-02	1.44E-04	1.44E-04
CEM3	1313-27-5	Molybdenum trioxide	4.62E-08	4.62E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.15E-02	1.15E-02	5.19E-05	5.19E-05
CEM3	7440-22-4	Silver and compounds	1.29E-08	1.29E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.21E-03	3.21E-03	1.45E-05	1.45E-05
CEM3	7631-86-9	Silica, crystalline (respirable)	2.10E-03	2.10E-03	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	5.23E+02	5.23E+02	2.36E+00	2.36E+00
CEM4	7440-38-2	Arsenic and compounds	6.85E-07	6.85E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.70E-01	1.70E-01	7.70E-04	7.70E-04
CEM4	7440-41-7	Beryllium and compounds	8.78E-09	8.78E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.19E-03	2.19E-03	9.88E-06	9.88E-06
CEM4	7440-43-9	Cadmium and compounds	1.01E-09	1.01E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.51E-04	2.51E-04	1.13E-06	1.13E-06
CEM4	7440-48-4	Cobalt and compounds	1.33E-08	1.33E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	3.32E-03	3.32E-03	1.50E-05	1.50E-05
CEM4	18540-29-9	Chromium VI, chromate and dichromate particulate	1.11E-07	1.11E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.76E-02	2.76E-02	1.25E-04	1.25E-04
CEM4	7439-97-6	Mercury and compounds	1.17E-08	1.17E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.90E-03	2.90E-03	1.31E-05	1.31E-05
CEM4	7439-96-5	Manganese and compounds	4.69E-07	4.69E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.17E-01	1.17E-01	5.28E-04	5.28E-04
CEM4	365	Nickel compounds, insoluble	2.16E-08	2.16E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	5.39E-03	5.39E-03	2.44E-05	2.44E-05
CEM4	7439-92-1	Lead and compounds	3.99E-08	3.99E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	9.94E-03	9.94E-03	4.49E-05	4.49E-05
CEM4	7440-36-0	Antimony and compounds	2.33E-07	2.33E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	5.80E-02	5.80E-02	2.62E-04	2.62E-04
CEM4	7440-39-3	Barium and compounds	3.54E-06	3.54E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	8.80E-01	8.80E-01	3.98E-03	3.98E-03
CEM4	7440-50-8	Copper and compounds	4.74E-08	4.74E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	1.18E-02	1.18E-02	5.34E-05	5.34E-05
CEM4	7440-62-2	Vanadium (fume or dust)	9.79E-08	9.79E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.44E-02	2.44E-02	1.10E-04	1.10E-04
CEM4	7440-66-6	Zinc and compounds	8.93E-08	8.93E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.22E-02	2.22E-02	1.00E-04	1.00E-04
CEM4	1313-27-5	Molybdenum trioxide	3.21E-08	3.21E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	8.00E-03	8.00E-03	3.61E-05	3.61E-05
CEM4	7440-22-4	Silver and compounds	8.98E-09	8.98E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	2.24E-03	2.24E-03	1.01E-05	1.01E-05
CEM4	7631-86-9	Silica, crystalline (respirable)	1.78E-03	1.78E-03	lb/ton	See Process TAC and GHG Emissions Sheet, p. 9	4.43E+02	4.43E+02	2.00E+00	2.00E+00
CEM5	7440-38-2	Arsenic and compounds	2.96E-07	2.96E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	5.55E-03	5.55E-03	2.51E-05	2.51E-05
CEM5	7440-43-9	Cadmium and compounds	7.10E-10	7.10E-10	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	1.33E-05	1.33E-05	6.03E-08	6.03E-08
CEM5	18540-29-9	Chromium VI, chromate and dichromate particulate	1.27E-07	1.27E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	2.38E-03	2.38E-03	1.08E-05	1.08E-05
CEM5	7439-92-1	Lead and compounds	3.66E-08	3.66E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	6.86E-04	6.86E-04	3.11E-06	3.11E-06
CEM5	7439-96-5	Manganese and compounds	3.78E-06	3.78E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	7.08E-02	7.08E-02	3.21E-04	3.21E-04
CEM5	365	Nickel compounds, insoluble	2.48E-07	2.48E-07	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	4.65E-03	4.65E-03	2.11E-05	2.11E-05
CEM5	12185-10-3	Phosphorus, white	1.60E-06	1.60E-06	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	3.00E-02	3.00E-02	1.36E-04	1.36E-04
CEM5	7631-86-9	Silica, crystalline (respirable)	1.36E-05	1.28E-05	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12	2.55E-01	2.55E-01	1.09E-03	1.09E-03
UDP	106-99-0	1,3-Butadiene	1.59E-03	1.59E-03	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.57E+01	3.57E+01	1.72E-01	1.72E-01
UDP	83-32-9	Acenaphthene	2.45E-05	2.45E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.50E-01	5.50E-01	2.64E-03	2.64E-03
UDP	208-96-8	Acenaphthylene	2.97E-05	2.97E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.67E-01	6.67E-01	3.21E-03	3.21E-03
UDP	75-07-0	Acetaldehyde	5.72E-03	5.72E-03	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.29E+02	1.29E+02	6.18E-01	6.18E-01
UDP	107-02-8	Acrolein	2.47E-04	2.47E-04	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.56E+00	5.56E+00	2.68E-02	2.68E-02
UDP	7664-41-7	Ammonia	2.12E-02	2.12E-02	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	4.76E+02	4.76E+02	2.29E+00	2.29E+00
UDP	120-12-7	Anthracene	2.93E-05	2.93E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.59E-01	6.59E-01	3.17E-03	3.17E-03
UDP	7440-38-2	Arsenic and compounds	1.17E-05	1.17E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.63E-01	2.63E-01	1.26E-03	1.26E-03
UDP	71-43-2	Benzene	1.36E-03	1.36E-03	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.06E+01	3.06E+01	1.47E-01	1.47E-01
UDP	56-55-3	Benz[a]anthracene	2.85E-05	2.85E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.41E-01	6.41E-01	3.08E-03	3.08E-03
UDP	50-32-8	Benzo[a]pyrene	2.59E-07	2.59E-07	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.83E-03	5.83E-03	2.80E-05	2.80E-05
UDP	205-99-2	Benzo[b]fluoranthene	4.89E-05	4.89E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.10E+00	1.10E+00	5.29E-03	5.29E-03
UDP	191-24-2	Benzo[g,h,i]perylene	2.08E-08	2.08E-08	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	4.68E-04	4.68E-04	2.25E-06	2.25E-06
UDP	207-08-9	Benzo[k]fluoranthene	4.89E-05	4.89E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.10E+00	1.10E+00	5.29E-03	5.29E-03
UDP	7440-43-9	Cadmium and compounds	1.09E-05	1.09E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.46E-01	2.46E-01	1.18E-03	1.18E-03
UDP	108-90-7	Chlorobenzene	1.46E-06	1.46E-06	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.28E-02	3.28E-02	1.58E-04	1.58E-04
UDP	218-01-9	Chrysene	2.61E-05	2.61E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.87E-01	5.87E-01	2.82E-03	2.82E-03
UDP	7440-50-8	Copper and compounds	2.99E-05	2.99E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.73E-01	6.73E-01	3.24E-03	3.24E-03
UDP	53-70-3	Dibenz[a,h]anthracene	2.55E-05	2.55E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.73E-01	5.73E-01	2.76E-03	2.76E-03
UDP	100-41-4	Ethyl benzene	7.96E-05	7.96E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.79E+00	1.79E+00	8.60E-03	8.60E-03
UDP	206-44-0	Fluoranthene	2.92E-05	2.92E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.56E-01	6.56E-01	3.15E-03	3.15E-03
UDP	86-73-7	Fluorene	1.54E-04	1.54E-04	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.47E+00	3.47E+00	1.67E-02	1.67E-02
UDP	50-00-0	Formaldehyde	1.26E-02	1.26E-02	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	2.83E+02	2.83E+02	1.36E+00	1.36E+00

UDP	110-54-3	Hexane	1.96E-04	1.96E-04	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	4.42E+00	4.42E+00	2.12E-02	2.12E-02
UDP	7647-01-0	Hydrochloric acid	1.36E-03	1.36E-03	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.06E+01	3.06E+01	1.47E-01	1.47E-01
UDP	18540-29-9	Chromium VI, chromate and dichromate particulate	7.30E-07	7.30E-07	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.64E-02	1.64E-02	7.89E-05	7.89E-05
UDP	193-39-5	Indeno[1,2,3-cd]pyrene	2.53E-05	2.53E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.68E-01	5.68E-01	2.73E-03	2.73E-03
UDP	7439-92-1	Lead and compounds	6.06E-05	6.06E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.36E+00	1.36E+00	6.55E-03	6.55E-03
UDP	7439-96-5	Manganese and compounds	2.26E-05	2.26E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.09E-01	5.09E-01	2.45E-03	2.45E-03
UDP	7439-97-6	Mercury and compounds	1.46E-05	1.46E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.28E-01	3.28E-01	1.58E-03	1.58E-03
UDP	91-20-3	Naphthalene	1.44E-04	1.44E-04	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.23E+00	3.23E+00	1.55E-02	1.55E-02
UDP	365	Nickel compounds, insoluble	2.85E-05	2.85E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.40E-01	6.40E-01	3.08E-03	3.08E-03
UDP	85-01-8	Phenanthrene	2.85E-04	2.85E-04	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.40E+00	6.40E+00	3.08E-02	3.08E-02
UDP	115-07-1	Propylene	3.41E-03	3.41E-03	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	7.66E+01	7.66E+01	3.69E-01	3.69E-01
UDP	129-00-0	Pyrene	6.15E-05	6.15E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.38E+00	1.38E+00	6.65E-03	6.65E-03
UDP	7782-49-2	Selenium and compounds	1.61E-05	1.61E-05	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.61E-01	3.61E-01	1.74E-03	1.74E-03
UDP	108-88-3	Toluene	7.69E-04	7.69E-04	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	1.73E+01	1.73E+01	8.32E-02	8.32E-02
UDP	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	3.09E-03	3.09E-03	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	6.96E+01	6.96E+01	3.35E-01	3.35E-01
UDP	7440-66-6	Zinc and compounds	1.64E-04	1.64E-04	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	3.68E+00	3.68E+00	1.77E-02	1.77E-02
UDP	200	Diesel particulate matter	2.45E-01	2.45E-01	lb/MMBtu	See Nonroad TAC and GHG Emissions Sheet, p. 2	5.50E+03	5.50E+03	2.64E+01	2.64E+01
EDG1	106-99-0	1,3-Butadiene	1.59E-03	1.59E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.98E+00	2.98E+00	7.15E-01	7.15E-01
EDG1	75-07-0	Acetaldehyde	5.72E-03	5.72E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	1.07E+01	1.07E+01	2.58E+00	2.58E+00
EDG1	107-02-8	Acrolein	2.47E-04	2.47E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	4.65E-01	4.65E-01	1.11E-01	1.11E-01
EDG1	7664-41-7	Ammonia	2.12E-02	2.12E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	3.97E+01	3.97E+01	9.54E+00	9.54E+00
EDG1	7440-38-2	Arsenic and compounds	1.17E-05	1.17E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.19E-02	2.19E-02	5.26E-03	5.26E-03
EDG1	71-43-2	Benzene	1.36E-03	1.36E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.55E+00	2.55E+00	6.13E-01	6.13E-01
EDG1	7440-43-9	Cadmium and compounds	1.09E-05	1.09E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.06E-02	2.06E-02	4.93E-03	4.93E-03
EDG1	108-90-7	Chlorobenzene	1.46E-06	1.46E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.74E-03	2.74E-03	6.58E-04	6.58E-04
EDG1	18540-29-9	Chromium VI, chromate and dichromate particulate	7.30E-07	7.30E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	1.37E-03	1.37E-03	3.29E-04	3.29E-04
EDG1	7440-50-8	Copper and compounds	2.99E-05	2.99E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	5.62E-02	5.62E-02	1.35E-02	1.35E-02
EDG1	200	Diesel particulate matter	8.98E-01	5.42E-01	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	1.69E+03	1.69E+03	2.44E+02	2.44E+02
EDG1	100-41-4	Ethyl benzene	7.96E-05	7.96E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	1.49E-01	1.49E-01	3.58E-02	3.58E-02
EDG1	50-00-0	Formaldehyde	1.26E-02	1.26E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.37E+01	2.37E+01	5.68E+00	5.68E+00
EDG1	110-54-3	Hexane	1.96E-04	1.96E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	3.69E-01	3.69E-01	8.85E-02	8.85E-02
EDG1	7439-92-1	Lead and compounds	6.06E-05	6.06E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	1.14E-01	1.14E-01	2.73E-02	2.73E-02
EDG1	7439-96-5	Manganese and compounds	2.26E-05	2.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	4.25E-02	4.25E-02	1.02E-02	1.02E-02
EDG1	7439-97-6	Mercury and compounds	1.46E-05	1.46E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.74E-02	2.74E-02	6.58E-03	6.58E-03
EDG1	91-20-3	Naphthalene	1.44E-04	1.44E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.70E-01	2.70E-01	6.48E-02	6.48E-02
EDG1	365	Nickel compounds, insoluble	2.85E-05	2.85E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	5.34E-02	5.34E-02	1.28E-02	1.28E-02
EDG1	83-32-9	Acenaphthene	2.45E-05	2.45E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	4.59E-02	4.59E-02	1.10E-02	1.10E-02
EDG1	208-96-8	Acenaphthylene	2.97E-05	2.97E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	5.57E-02	5.57E-02	1.34E-02	1.34E-02
EDG1	120-12-7	Anthracene	2.93E-05	2.93E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	5.50E-02	5.50E-02	1.32E-02	1.32E-02
EDG1	56-55-3	Benz[a]anthracene	2.85E-05	2.85E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	5.35E-02	5.35E-02	1.28E-02	1.28E-02
EDG1	50-32-8	Benzo[a]pyrene	2.59E-07	2.59E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	4.86E-04	4.86E-04	1.17E-04	1.17E-04
EDG1	205-99-2	Benzo[b]fluoranthene	4.89E-05	4.89E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	9.18E-02	9.18E-02	2.20E-02	2.20E-02
EDG1	191-24-2	Benzo[g,h,i]perylene	2.08E-08	2.08E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	3.91E-05	3.91E-05	9.37E-06	9.37E-06
EDG1	207-08-9	Benzo[k]fluoranthene	4.89E-05	4.89E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	9.18E-02	9.18E-02	2.20E-02	2.20E-02
EDG1	218-01-9	Chrysene	2.61E-05	2.61E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	4.90E-02	4.90E-02	1.18E-02	1.18E-02
EDG1	53-70-3	Dibenz[a,h]anthracene	2.55E-05	2.55E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	4.78E-02	4.78E-02	1.15E-02	1.15E-02
EDG1	206-44-0	Fluoranthene	2.92E-05	2.92E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	5.48E-02	5.48E-02	1.31E-02	1.31E-02
EDG1	86-73-7	Fluorene	1.54E-04	1.54E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.89E-01	2.89E-01	6.94E-02	6.94E-02
EDG1	193-39-5	Indeno[1,2,3-cd]pyrene	2.53E-05	2.53E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	4.74E-02	4.74E-02	1.14E-02	1.14E-02
EDG1	85-01-8	Phenanthrene	2.85E-04	2.85E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	5.34E-01	5.34E-01	1.28E-01	1.28E-01
EDG1	129-00-0	Pyrene	6.15E-05	6.15E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	1.15E-01	1.15E-01	2.77E-02	2.77E-02
EDG1	115-07-1	Propylene	3.41E-03	3.41E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	6.40E+00	6.40E+00	1.54E+00	1.54E+00
EDG1	7782-49-2	Selenium and compounds	1.61E-05	1.61E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	3.01E-02	3.01E-02	7.24E-03	7.24E-03
EDG1	108-88-3	Toluene	7.69E-04	7.69E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	1.44E+00	1.44E+00	3.47E-01	3.47E-01
EDG1	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	3.09E-03	3.09E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	5.81E+00	5.81E+00	1.39E+00	1.39E+00
EDG1	7440-66-6	Zinc and compounds	1.64E-04	1.64E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	3.07E-01	3.07E-01	7.37E-02	7.37E-02
EDG1	7647-01-0	Hydrochloric acid	1.36E-03	1.36E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.55E+00	2.55E+00	6.13E-01	6.13E-01
MFD	106-99-0	1,3-Butadiene	1.08E-04	1.08E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	5.05E-02	5.05E-02	4.86E-04	4.86E-04
MFD	91-57-6	2-Methyl naphthalene	1.02E-06	1.02E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	4.78E-04	4.78E-04	4.60E-06	4.60E-06
MFD	83-32-9	Acenaphthene	1.54E-06	1.54E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	7.21E-04	7.21E-04	6.93E-06	6.93E-06
MFD	208-96-8	Acenaphthylene	4.74E-07	4.74E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	2.22E-04	2.22E-04	2.13E-06	2.13E-06
MFD	75-07-0	Acetaldehyde	2.56E-03	2.56E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.20E+00	1.20E+00	1.15E-02	1.15E-02
MFD	107-02-8	Acrolein	2.56E-03	2.56E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.20E+00	1.20E+00	1.15E-02	1.15E-02
MFD	7664-41-7	Ammonia	2.12E-02	2.12E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	9.90E+00	9.90E+00	9.52E-02	9.52E-02
MFD	120-12-7	Anthracene	1.74E-07	1.74E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	8.16E-05	8.16E-05	7.85E-07	7.85E-07
MFD	7440-38-2	Arsenic and compounds	1.17E-05	1.17E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	5.46E-03	5.46E-03	5.25E-05	5.25E-05
MFD	71-43-2	Benzene	3.21E-05	3.21E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.50E-02	1.50E-02	1.44E-04	1.44E-04
MFD	56-55-3	Benz[a]anthracene	9.85E-08	9.85E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	4.61E-05	4.61E-05	4.43E-07	4.43E-07
MFD	50-32-8	Benzo[a]pyrene	5.51E-08	5.51E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	2.58E-05	2.58E-05	2.48E-07	2.48E-07
MFD	205-99-2	Benzo[b]fluoranthene	4.87E-08	4.87E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	2.28E-05	2.28E-05	2.19E-07	2.19E-07
MFD	192-97-2	Benzo[e]pyrene	1.02E-07	1.02E-07	lb/MMBtu	p-Dichlorobenzene (1,4-Dichlorobenzene)	4.78E-05	4.78E-05	4.60E-07	4.60E-07
MFD	191-24-2	Benzo[g,h,i]perylene	6.20E-08	6.20E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	2.90E-05	2.90E-05	2.79E-07	2.79E-07
MFD	207-08-9	Benzo[k]fluoranthene	6.07E-07	6.07E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	2.84E-04	2.84E-04	2.73E-06	2.73E-06
MFD	7440-43-9	Cadmium and compounds	1.09E-05	1.09E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	5.12E-03	5.12E-03	4.93E-05	4.93E-05
MFD	108-90-7	Chlorobenzene	1.46E-06	1.46E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	6.83E-04	6.83E-04	6.57E-06	6.57E-06
MFD	218-01-9	Chrysene	9.34E-08	9.34E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	4.37E-05	4.37E-05	4.20E-07	4.20E-07
MFD	7440-50-8	Copper and compounds	2.99E-05	2.99E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.40E-02	1.40E-02	1.35E-04	1.35E-04
MFD	53-70-3	Dibenz[a,h]anthracene	4.74E-08	4.74E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	2.22E-05	2.22E-05	2.13E-07	2.13E-07
MFD	100-41-4	Ethyl benzene	1.46E-06	1.46E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	6.83E-04	6.83E-04	6.57E-06	6.57E-06
MFD	206-44-0	Fluoranthene	2.42E-07	2.42E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.13E-04	1.13E-04	1.09E-06	1.09E-06
MFD	86-73-7	Fluorene	8.54E-07	8.54E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	4.00E-04	4.00E-04	3.84E-06	3.84E-06
MFD	50-00-0	Formaldehyde	2.56E-03	2.56E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.20E+00	1.20E+00	1.15E-02	1.15E-02
MFD	110-54-3	Hexane	2.55E-05	2.55E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.20E-02	1.20E-02	1.15E-04	1.15E-04
MFD	7647-01-0	Hydrochloric acid	1.36E-03	1.36E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	6.36E-01	6.36E-01	6.12E-03	6.12E-03
MFD	18540-29-9	Chromium VI, chromate and dichromate particulate	7.30E-07	7.30E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	3.42E-04	3.42E-04	3.28E-06	3.28E-06
MFD	193-39-5	Indeno[1,2,3-cd]pyrene	4.85E-08	4.85E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	2.27E-05	2.27E-05	2.18E-07	2.18E-07
MFD	7439-92-1	Lead and compounds	6.06E-05	6.06E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	2.83E-02	2.83E-02	2.73E-04	2.73E-04
MFD	7439-96-5	Manganese and compounds	2.26E-05	2.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.06E-02	1.06E-02	1.02E-04	1.02E-04
MFD	7439-97-6	Mercury and compounds	1.46E-05	1.46E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	6.83E-03	6.83E-03	6.57E-05	6.57E-05
MFD	91-20-3	Naphthalene	3.87E-05	3.87E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.81E-02	1.81E-02	1.74E-04	1.74E-04
MFD	365	Nickel compounds, insoluble	2.85E-05	2.85E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.33E-02	1.33E-02	1.28E-04	1.28E-04
MFD	198-55-0	Perylene	1.98E-07	1.98E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	9.26E-05	9.26E-05	8.90E-07	8.90E-07
MFD	85-01-8	Phenanthrene	2.72E-06	2.72E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.27E-03	1.27E-03	1.22E-05	1.22E-05
MFD	115-07-1	Propylene	7.30E-05	7.30E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	3.42E-02	3.42E-02	3.28E-04	3.28E-04
MFD	129-00-0	Pyrene	2.98E-07	2.98E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.39E-04	1.39E-04	1.34E-06	1.34E-06
MFD	7782-49-2	Selenium and compounds	1.61E-05	1.61E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	7.51E-03	7.51E-03	7.22E-05	7.22E-05
MFD	108-88-3	Toluene	3.21E-05	3.21E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	1.50E-02	1.50E-02	1.44E-04	1.44E-04
MFD	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	1.17E-05	1.17E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	5.46E-03	5.46E-03	5.25E-05	5.25E-05
MFD	7440-66-6	Zinc and compounds	1.64E-04	1.64E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 4	7.65E-02	7.65E-02	7.36E-04	7.36E-04
EDFP	106-99-0	1,3-Butadiene	1.59E-03	1.59E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.98E-01	2.98E-01	7.15E-02	7.15E-02
EDFP	75-07-0	Acetaldehyde	5.72E-03	5.72E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	1.07E+00	1.07E+00	2.58E-01	2.58E-01
EDFP	107-02-8	Acrolein	2.47E-04	2.47E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	4.65E-02	4.65E-02	1.11E-02	1.11E-02
EDFP	7664-41-7	Ammonia	2.12E-02	2.12E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	3.97E+00	3.97E+00	9.54E-01	9.54E-01
EDFP	7440-38-2	Arsenic and compounds	1.17E-05	1.17E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.19E-03	2.19E-03	5.26E-04	5.26E-04
EDFP	71-43-2	Benzene	1.36E-03	1.36E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6	2.55E-01	2.55E-01	6.13E-02	6.13E-02

EDFP	7440-43-9	Cadmium and compounds		1.09E-05	1.09E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		2.06E-03	2.06E-03		4.93E-04	4.93E-04
EDFP	108-90-7	Chlorobenzene		1.46E-06	1.46E-06	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		2.74E-04	2.74E-04		6.58E-05	6.58E-05
EDFP	18540-29-9	Chromium VI, chromate and dichromate particulate		7.30E-07	7.30E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		1.37E-04	1.37E-04		3.29E-05	3.29E-05
EDFP	7440-50-8	Copper and compounds		2.99E-05	2.99E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		5.62E-03	5.62E-03		1.35E-03	1.35E-03
EDFP	200	Diesel particulate matter		8.98E-01	5.42E-01	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		1.69E+02	1.69E+02		2.44E+01	2.44E+01
EDFP	100-41-4	Ethyl benzene		7.96E-05	7.96E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		1.49E-02	1.49E-02		3.58E-03	3.58E-03
EDFP	50-00-0	Formaldehyde		1.26E-02	1.26E-02	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		2.37E+00	2.37E+00		5.68E-01	5.68E-01
EDFP	110-54-3	Hexane		1.96E-04	1.96E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		3.69E-02	3.69E-02		8.85E-03	8.85E-03
EDFP	7439-92-1	Lead and compounds		6.06E-05	6.06E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		1.14E-02	1.14E-02		2.73E-03	2.73E-03
EDFP	7439-96-5	Manganese and compounds		2.26E-05	2.26E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		4.25E-03	4.25E-03		1.02E-03	1.02E-03
EDFP	7439-97-6	Mercury and compounds		1.46E-05	1.46E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		2.74E-03	2.74E-03		6.58E-04	6.58E-04
EDFP	91-20-3	Naphthalene		1.44E-04	1.44E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		2.70E-02	2.70E-02		6.48E-03	6.48E-03
EDFP	365	Nickel compounds, insoluble		2.85E-05	2.85E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		5.34E-03	5.34E-03		1.28E-03	1.28E-03
EDFP	83-32-9	Acenaphthene		2.45E-05	2.45E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		4.59E-03	4.59E-03		1.10E-03	1.10E-03
EDFP	208-96-8	Acenaphthylene		2.97E-05	2.97E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		5.57E-03	5.57E-03		1.34E-03	1.34E-03
EDFP	120-12-7	Anthracene		2.93E-05	2.93E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		5.50E-03	5.50E-03		1.32E-03	1.32E-03
EDFP	56-55-3	Benz[a]anthracene		2.85E-05	2.85E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		5.35E-03	5.35E-03		1.28E-03	1.28E-03
EDFP	50-32-8	Benzo[a]pyrene		2.59E-07	2.59E-07	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		4.86E-05	4.86E-05		1.17E-05	1.17E-05
EDFP	205-99-2	Benzo[b]fluoranthene		4.89E-05	4.89E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		9.18E-03	9.18E-03		2.20E-03	2.20E-03
EDFP	191-24-2	Benzo[g,h,i]perylene		2.08E-08	2.08E-08	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		3.91E-06	3.91E-06		9.37E-07	9.37E-07
EDFP	207-08-9	Benzo[k]fluoranthene		4.89E-05	4.89E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		9.18E-03	9.18E-03		2.20E-03	2.20E-03
EDFP	218-01-9	Chrysene		2.61E-05	2.61E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		4.90E-03	4.90E-03		1.18E-03	1.18E-03
EDFP	53-70-3	Dibenz[a,h]anthracene		2.55E-05	2.55E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		4.78E-03	4.78E-03		1.15E-03	1.15E-03
EDFP	206-44-0	Fluoranthene		2.92E-05	2.92E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		5.48E-03	5.48E-03		1.31E-03	1.31E-03
EDFP	86-73-7	Fluorene		1.54E-04	1.54E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		2.89E-02	2.89E-02		6.94E-03	6.94E-03
EDFP	193-39-5	Indeno[1,2,3-cd]pyrene		2.53E-05	2.53E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		4.74E-03	4.74E-03		1.14E-03	1.14E-03
EDFP	85-01-8	Phenanthrene		2.85E-04	2.85E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		5.34E-02	5.34E-02		1.28E-02	1.28E-02
EDFP	129-00-0	Pyrene		6.15E-05	6.15E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		1.15E-02	1.15E-02		2.77E-03	2.77E-03
EDFP	115-07-1	Propylene		3.41E-03	3.41E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		6.40E-01	6.40E-01		1.54E-01	1.54E-01
EDFP	7782-49-2	Selenium and compounds		1.61E-05	1.61E-05	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		3.01E-03	3.01E-03		7.24E-04	7.24E-04
EDFP	108-88-3	Toluene		7.69E-04	7.69E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		1.44E-01	1.44E-01		3.47E-02	3.47E-02
EDFP	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		3.09E-03	3.09E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		5.81E-01	5.81E-01		1.39E-01	1.39E-01
EDFP	7440-66-6	Zinc and compounds		1.64E-04	1.64E-04	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		3.07E-02	3.07E-02		7.37E-03	7.37E-03
EDFP	7647-01-0	Hydrochloric acid		1.36E-03	1.36E-03	lb/MMBtu	See Process TAC and GHG Emissions Sheet, p. 6		2.55E-01	2.55E-01		6.13E-02	6.13E-02
LS1	7631-86-9	Silica, crystalline (respirable)		3.40E-09	3.40E-09	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12		1.12E-06	1.12E-06		1.87E-07	1.87E-07
LS2	7631-86-9	Silica, crystalline (respirable)		0.000000028	2.80E-08	lb/ton	See Process TAC and GHG Emissions Sheet, p. 12		9.20E-06	9.20E-06		2.52E-08	2.52E-08
TG1	71-43-2	Benzene		0.000277845	0.000277845		See Tank Emission Calculations Sheet, p. 1		3.33E+01	3.33E+01		9.13E-02	9.13E-02
TG1	92-52-4	Biphenyl		1.54E-06	1.54E-06		See Tank Emission Calculations Sheet, p. 1		1.85E-01	1.85E-01		5.07E-04	5.07E-04
TG1	110-82-7	Cyclohexane		0.000037046	0.000037046		See Tank Emission Calculations Sheet, p. 1		4.45E+00	4.45E+00		1.22E-02	1.22E-02
TG1	100-41-4	Ethyl benzene		0.000247745	0.000247745		See Tank Emission Calculations Sheet, p. 1		2.97E+01	2.97E+01		8.15E-02	8.15E-02
TG1	110-54-3	Hexane		0.00110181	0.00110181		See Tank Emission Calculations Sheet, p. 1		1.32E+02	1.32E+02		3.62E-01	3.62E-01
TG1	91-20-3	Naphthalene		6.85E-05	6.85E-05		See Tank Emission Calculations Sheet, p. 1		8.22E+00	8.22E+00		2.25E-02	2.25E-02
TG1	108-95-2	Phenol		8.49E-06	8.49E-06		See Tank Emission Calculations Sheet, p. 1		1.02E+00	1.02E+00		2.79E-03	2.79E-03
TG1	108-88-3	Toluene		0.001113232	0.001113232		See Tank Emission Calculations Sheet, p. 1		1.34E+02	1.34E+02		3.66E-01	3.66E-01
TG1	95-63-6	1,2,4-Trimethylbenzene		0.000385896	0.000385896		See Tank Emission Calculations Sheet, p. 1		4.63E+01	4.63E+01		1.27E-01	1.27E-01
TG1	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		0.001106749	0.001106749		See Tank Emission Calculations Sheet, p. 1		1.33E+02	1.33E+02		3.64E-01	3.64E-01
TG1	98-82-8	Isopropylbenzene (cumene)		7.72E-05	7.72E-05		See Tank Emission Calculations Sheet, p. 1		9.26E+00	9.26E+00		2.54E-02	2.54E-02
TD1	71-43-2	Benzene		2.86E-10	2.86E-10		See Tank Emission Calculations Sheet, p. 1		6.87E-05	6.87E-05		1.88E-07	1.88E-07
TD1	92-52-4	Biphenyl		3.41E-08	3.41E-08		See Tank Emission Calculations Sheet, p. 1		8.18E-03	8.18E-03		2.24E-05	2.24E-05
TD1	100-41-4	Ethyl benzene		4.43E-09	4.43E-09		See Tank Emission Calculations Sheet, p. 1		1.06E-03	1.06E-03		2.91E-06	2.91E-06
TD1	110-54-3	Hexane		3.41E-07	3.41E-07		See Tank Emission Calculations Sheet, p. 1		8.18E-02	8.18E-02		2.24E-04	2.24E-04
TD1	91-20-3	Naphthalene		1.87E-07	1.87E-07		See Tank Emission Calculations Sheet, p. 1		4.50E-02	4.50E-02		1.23E-04	1.23E-04
TD1	85-01-8	Phenanthrene		4.26E-08	4.26E-08		See Tank Emission Calculations Sheet, p. 1		1.02E-02	1.02E-02		2.80E-05	2.80E-05
TD1	108-95-2	Phenol		2.18E-08	2.18E-08		See Tank Emission Calculations Sheet, p. 1		5.24E-03	5.24E-03		1.43E-05	1.43E-05
TD1	100-42-5	Styrene		1.09E-08	1.09E-08		See Tank Emission Calculations Sheet, p. 1		2.62E-03	2.62E-03		7.17E-06	7.17E-06
TD1	108-88-3	Toluene		1.09E-08	1.09E-08		See Tank Emission Calculations Sheet, p. 1		2.62E-03	2.62E-03		7.17E-06	7.17E-06
TD1	95-63-6	1,2,4-Trimethylbenzene		3.41E-07	3.41E-07		See Tank Emission Calculations Sheet, p. 1		8.18E-02	8.18E-02		2.24E-04	2.24E-04
TD1	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		9.88E-08	9.88E-08		See Tank Emission Calculations Sheet, p. 1		2.37E-02	2.37E-02		6.50E-05	6.50E-05
TD1	7439-97-6	Mercury and compounds		1.36E-11	1.36E-11		See Tank Emission Calculations Sheet, p. 1		3.27E-06	3.27E-06		8.96E-09	8.96E-09
TD2	71-43-2	Benzene		4.82E-10	4.82E-10		See Tank Emission Calculations Sheet, p. 1		7.22E-06	7.22E-06		1.98E-08	1.98E-08
TD2	92-52-4	Biphenyl		5.73E-08	5.73E-08		See Tank Emission Calculations Sheet, p. 1		8.60E-04	8.60E-04		2.36E-06	2.36E-06
TD2	100-41-4	Ethyl benzene		7.45E-09	7.45E-09		See Tank Emission Calculations Sheet, p. 1		1.12E-04	1.12E-04		3.06E-07	3.06E-07
TD2	110-54-3	Hexane		5.73E-07	5.73E-07		See Tank Emission Calculations Sheet, p. 1		8.60E-03	8.60E-03		2.36E-05	2.36E-05
TD2	91-20-3	Naphthalene		3.15E-07	3.15E-07		See Tank Emission Calculations Sheet, p. 1		4.73E-03	4.73E-03		1.30E-05	1.30E-05
TD2	85-01-8	Phenanthrene		7.17E-08	7.17E-08		See Tank Emission Calculations Sheet, p. 1		1.08E-03	1.08E-03		2.95E-06	2.95E-06
TD2	108-95-2	Phenol		3.67E-08	3.67E-08		See Tank Emission Calculations Sheet, p. 1		5.50E-04	5.50E-04		1.51E-06	1.51E-06
TD2	100-42-5	Styrene		1.83E-08	1.83E-08		See Tank Emission Calculations Sheet, p. 1		2.75E-04	2.75E-04		7.54E-07	7.54E-07
TD2	108-88-3	Toluene		1.83E-08	1.83E-08		See Tank Emission Calculations Sheet, p. 1		2.75E-04	2.75E-04		7.54E-07	7.54E-07
TD2	95-63-6	1,2,4-Trimethylbenzene		5.73E-07	5.73E-07		See Tank Emission Calculations Sheet, p. 1		8.60E-03	8.60E-03		2.36E-05	2.36E-05
TD2	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		1.66E-07	1.66E-07		See Tank Emission Calculations Sheet, p. 1		2.49E-03	2.49E-03		6.83E-06	6.83E-06
TD2	7439-97-6	Mercury and compounds		2.29E-11	2.29E-11		See Tank Emission Calculations Sheet, p. 1		3.44E-07	3.44E-07		9.42E-10	9.42E-10

INSERT ROWS ABOVE THIS LINE **INSERT ROWS ABOVE THIS LINE** **INSERT ROWS ABOVE THIS LINE** **INSERT ROWS ABOVE THIS LI**

INSTRUCTIONS:
- **Toxic Emissions Unit and Stack/Fugitive ID**: use IDs consistent with permit identifiers if applicable.
- **Emission Units or Activity Description:** where possible, maintain consistency with permitted/reported Units/Type.
- **Material Name:** this is the commercial name that is provided on the manufacturer's SDS.
- **Material Waste:** this category should be used to account for all waste material shipped off-site, lost to drain, or incorporated into product.
- **Max Daily Activity:** for semi-continuous/batch processes this value should account for co-occurring activities, process and/or maintenance, that would account for the potential maximum emissions activities for this pollutant.
  - **Actual:** values should be based on the last full year reported to DEQ, or estimates of normal activity (new sources).
  - **Capacity:** maximum activity value achievable with 100% operational up-time for this activity.
  - **Requested PTE:** values that a source is requesting to be permitted on that differ from "Actuals" and "Capacity".

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5/10/2021

Emissions Unit/Product Information				Stack/Fugitive Information		Material Usage						Material Waste					
						Annual - Chronic [lb/year]			Max Daily - Acute [lb/day]			Annual - Chronic [lb/year]			Max Daily - Acute [lb/day]		
Toxics Emissions Unit ID	Emission Unit or Activity Description	Material Name	Manufacturer	Emission Type (e.g. Point or Fugitive)	Stack or Fugitive ID	Actual	Requested PTE	Capacity	Actual	Requested PTE	Capacity	Actual	Requested PTE	Capacity	Actual	Requested PTE	Capacity
TEU-Booth	Widget Paint Booth - atomizer spray guns (EXAMPLE)	Widget Paint-A	Widget Paint Co.	Point	ST-4	12,000	14,000	20,000	36	40	52	2000	2600	5000	5	7	14
TEU-Booth	Widget Paint Booth - atomizer spray guns (EXAMPLE)	Widget Paint-B	Widget Paint Co.	Point	ST-4	950	1200	1500	5	10	15	15	30	40	0.5	1	2
N/A																	

INSTRUCTIONS:

- **Material Name**: must be consistent with **Material Name** on "*Material Balance Activities*" worksheet *Column C*.
- **CAS or DEQ ID**: either use the drop-down provided or simply cut and paste each pollutant CAS number or DEQ ID (see the DEQ Pollutant List worksheet) emitted by the referenced TEU.
- **Chemical Name:** if a CAS number or DEQ ID is entered in *Column C*, *Column D* should perform a lookup from the DEQ Air Toxics list; alternatively, simply cut and paste the chemical names that correspond to the CAS numbers/DEQ ID in *Column C* if applicable.
- **Control Efficiency:** enter the pollutant specific control efficiency - this should include all capture and removal process efficiencies applicable to each individual pollutant.
- **Percent Composition:** provide raw percent composition values for the pollutant as reported by supporting manufacturer documentation.
- **Reference/Notes:** provide references and notes for control efficiencies and/or any adjustments applied to material usage data via **Material Waste** (*Columns M-R*) on the "*Material Balance Activities*" worksheet.
- **Calculated Emissions:** follow guidance in "*Form Instructions*" worksheet for specific formulas.

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				Emissions Data			Calculated Emissions					
							Annual Emissions - Chronic [lb/yr]			Total Daily Emissions - Acute [lb/day]		
Unit ID	Material Name	CAS or DEQ ID	Chemical Name	Control Efficiency	Percent Composition	Reference/Notes	Actual	Requested PTE	Capacity	Actual	Requested PTE	Capacity
TEU-BOOTH	Widget Paint-A	67-56-1	Methanol	0.00%	35.00%		3500	3990	5250	10.85	11.55	13.3
TEU-BOOTH	Widget Paint-A	100-40-3	4-Vinylcyclohexene	0.00%	48.00%		4800	5472	7200	14.88	15.84	18.24
TEU-BOOTH	Widget Paint-A	18540-29-9	Chromium VI, chromate and dichromate particulate	99.72%	5.00%	Includes Transfer Efficiency (72%) and Filter Remova	1.4	1.596	2.1	0.00434	0.00462	0.00532
TEU-BOOTH	Widget Paint-B	90-43-7	2-Phenylphenol	0.00%	0.50%		4.675	5.85	7.3	0.0225	0.045	0.065
TEU-BOOTH	Widget Paint-B	50-00-0	Formaldehyde	0.00%	70.00%		654.5	819	1022	3.15	6.3	9.1
TEU-BOOTH	Widget Paint-B	7440-36-0	Antimony and compounds	99.72%	5.00%	Includes Transfer Efficiency (72%) and Filter Remova	0.1309	0.1638	0.2044	0.00063	0.00126	0.00182
N/A												

AIR SCIENCES INC.

DENVER • PORTLAND • LOS ANGELES

Grassy Mountain Mine Cleaner Air Oregon Risk Assessment Report

PREPARED FOR:
CALICO RESOURCES USA CORP.

PROJECT NO. 343-1
AUGUST 1, 2022

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Appendix A – Model Source Parameters

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1.0 INTRODUCTION

Calico Resources USA Corp (Calico) is providing this Risk Assessment Report to support its request for a Standard Air Contaminant Discharge Permit (ACDP) for the proposed Grassy Mountain Mine facility (facility). As part of the Standard ACDP application, the facility is required to demonstrate compliance under the Cleaner Air Oregon (CAO) program. This report presents a CAO Level 3 Risk Assessment. Oregon Department of Environmental Quality (DEQ) has previously reviewed and approved other required steps in the CAO process, as summarized in Table 1-1.

Table 1-1. CAO Process Step Submittals and Approvals

CAO Requirement	Submittal Date	Oregon DEQ Approval Date
CAO Emissions Inventory	April 21, 2021 (Final Revision—June 21, 2022)	June 28, 2022
CAO Modeling Protocol and Risk Assessment Work Plan		

A description of the facility and its processes are presented in Section 2.0. The methods used for the air quality evaluation of the potential air emissions from facility sources are presented in Section 4.0. The dispersion model (AERMOD), modeling techniques, source characterizations and emissions, the receptors, the meteorological dataset, and the ambient air quality standards are described in the Modeling Protocol and Risk Assessment Work Plan (RAWP) previously approved by Oregon DEQ.[1] Section 5.0 describes the risk assessment methodology and risk characterization using AERMOD. Section 6.0 presents the results of the exposure assessment and an uncertainty evaluation.

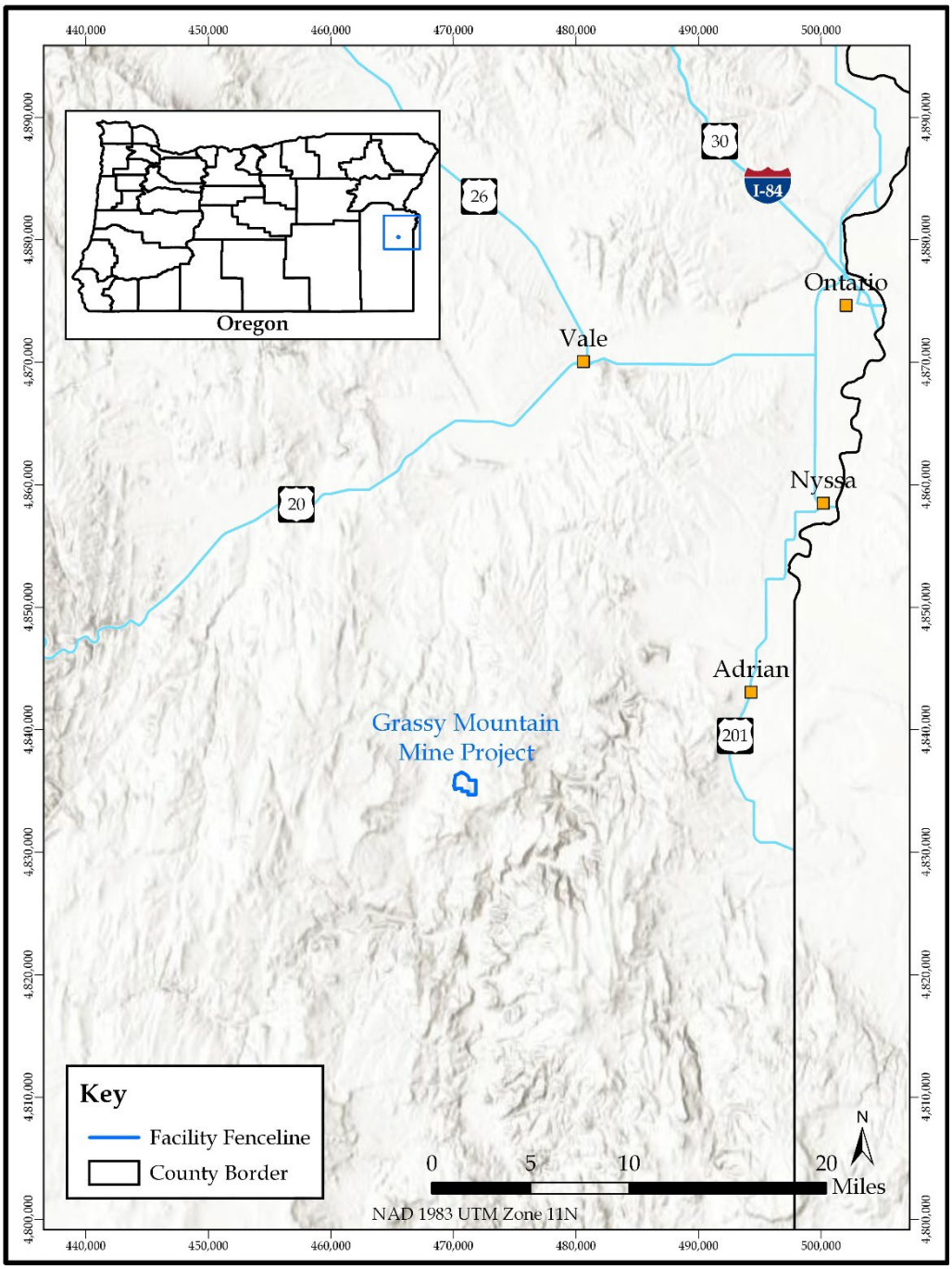
[1] Air Sciences. 2022. Grassy Mountain Mine Air Quality Modeling Protocol and Risk Assessment Work Plan. August 1, 2022. The RAWP was revised to address a comment in DEQ's approval letter dated June 28, 2022.

2.0 FACILITY DESCRIPTION

2.1 Facility Location

The facility will be located approximately 24 kilometers south-southwest of Adrian, Oregon, in Malheur County. A location map for the facility is presented in Figure 2-1.

Figure 2-1. Facility Location Map



2.2 Facility Process Description

The project will consist of an underground gold and silver ore mine using the drift and fill mining method, and a process facility to mill, refine, and melt gold and silver ore into doré bars for further processing off-site.

The underground mine will be developed using drill and blast techniques. A main ramp will be established from the portal to the bottom level. A level access will be mined from the main ramp to the production area. As ore is removed from the production area, cemented rockfill (CRF) or rockfill will be placed to fill the production drifts, eliminating voids in the production area. The rock used in the CRF or rockfill will come from a nearby borrow pit or the waste rock storage facility (WRSF). The CRF will require a backfill batch plant at the surface. A mobile crushing unit located in the borrow pit will crush borrow pit material. The crushed rock from the borrow pit will be hauled to the backfill batch plant and used for CRF or hauled directly underground for rockfill. Material from the WRSF may also be hauled to the backfill batch plant to be used as CRF or hauled directly underground to be used as rockfill.

Economic material from the underground mine will be hauled using underground trucks from the production area to a stockpile on the surface. A front-end loader will take the material from the stockpile to a mobile crushing unit that will include a jaw crusher as the primary stage, a screen, and a secondary cone crusher for further size reduction. Crushed ore is then conveyed to a fine-ore bin, which is then transferred to the mill via a feed conveyor; from here, the process is a wet process. The crushed ore will be ground by a ball mill in a closed circuit with a hydro-cyclone cluster. The hydro-cyclone overflow will flow to a leach/ carbon-in-leach (CIL) circuit via a pre-aeration tank. Lime is added during pre-aeration to control pH, and cyanide is added to the first leach tank. The leach/CIL circuit consists of a pre-aeration tank, two leach tanks and a series of seven CIL tanks.

Leached gold and silver will be adsorbed onto activated granular carbon, which is present in all CIL tanks. Slurry advances through each of the seven CIL tanks. Barren carbon is added to the last tank and flows through the circuit in the opposite direction to the slurry: loaded carbon extracted for the elution process is removed from CIL Tank 1. The elution process strips gold and silver from the carbon into solution. Pregnant solution (solution loaded with gold and silver) is transferred to the gold room, and stripped carbon is regenerated in the propane-fired carbon regeneration kiln before being recycled to the CIL circuit. Some carbon loss occurs during heating in the kiln, and new carbon is added along with regenerated carbon to CIL Tank 7.

The gold room will house the electrowinning cells, mercury retort, barring furnace, and associated support equipment. In the electrowinning cells, gold and silver are plated onto

cathodes using electrolysis. Periodically, the electrowinning cells will be opened, and the sludge cleaned out manually with a high-pressure spray gun. Sludge from the cells will flow by gravity to the electrowinning-sludge-filter feed tank and pumped through a filter press to be dewatered. Dewatered sludge is to be collected in trays and placed in the mercury retort to dry the sludge and remove mercury. Dried sludge will be removed from the mercury retort and combined with fluxes in a flux mixer before being charged into the melting furnace, where the sludge is melted and poured into doré bars.

The CIL tailings will be pumped to an agitated cyanide detoxification tank, where lime will be added to buffer pH, copper sulfate will be added as a reaction catalyst, and sodium metabisulfite will be added. Detoxified slurry will overflow from the detoxification tank to the tailings pump box where it will be pumped to the tailings management facility by the tailings pumps.

3.0 EMISSIONS ESTIMATES AND MODELED EMISSION UNITS

Daily and annual toxic air contaminants (TAC) emission estimates for the process equipment and emissions control devices considered to be toxics emissions units (TEU), as defined in Oregon Administrative Rule (OAR) 340-245-0020(60), were prepared by Air Sciences Inc. in consultation with Calico, as shown in the CAO emissions inventory. The CAO emissions inventory was approved by the Oregon DEQ on June 28, 2022.

Each TEU included in the Oregon DEQ-approved modeling protocol was modeled using Risk Equivalent Emission Rate (REER) for all modeled source types. Additional details describing the REER modeling approach are provided in Section 5.3, including modeled source allocation. Emission sources include exhaust stacks (generators, silo vents, heaters, and process sources) as well as fugitive emission sources (blasting, hauling, material handling, crushing, conveying, the tailings storage area, tailings pond, fuel storage tanks, and CIL process tanks). The following subsections provide details for each modeled TEU at the proposed facility.

A complete list of modeled sources and descriptions is also provided in Appendix A.

3.1 Underground Mine and Borrow Pit

Activities associated with underground mining were characterized using a 24 hr/day, 4 day/week schedule. Therefore, daily and annual emission rates were developed separately. All emissions from underground activities are released to the atmosphere through a single exhaust vent and were modeled as a point source (identified by the model source ID UG). However, individual TEUs were characterized based on activity type. Activities generating fugitive dust (material handling, drilling, and blasting), TEU ID UFD, were derived from the projected tons of ore extracted on a daily basis following the mine schedule. Combustion emissions from blasting, TEU ID UB, were derived using information from Calico about the blasting schedule and annual emulsion usage. Combustion emissions from non-road equipment, TEU ID UDP, were derived from utilization rates and fleet details provided by Calico.

3.2 Borrow Pit

A quarry within the facility boundary will provide "borrow" material for backfilling the underground mine once ore is extracted. Activities include occasional blasting (at maximum intervals of once per day, twice per month), between which new holes are drilled for the next blast. Blasted material is transferred to a crusher, crushed, then transferred to haul trucks to be hauled underground. These activities will occur on a 12 hr/day, 260 day/year schedule. Blasting creates combustion by-products as well as fugitive dust, and were characterized separately. Due to the shared process units (tons of rock), all fugitive dust sources in the borrow

area were combined into a single TEU ID, AFD. The model allocated these emissions according to source type: blasting volume source ID BRWBLAST, pit area source ID BRW, and crushing circuit volume source ID BC.

3.3 Process Area and Refinery

In contrast to the mine, the process area and refinery were modeled assuming a consistent, continuous operating schedule, 24 hours/day, 365 days/year, with the exception of the furnace, which will operate twice per week for 7.5 hours each operation.

The process area includes an ore crushing circuit (OC), a fine ore stockpile (STK), and a mill (the mill is a contained, wet process and is assumed to have zero emissions). The ore crushing circuit and stockpile were modeled as volume sources.

The refinery includes several TEUs: a lime silo (LS), the two leach tanks (LEACH1–2), a carbon-in-leach tank circuit (CIL1–CIL7), a laboratory (LAB), a carbon kiln (CK), mercury retort (MR), electrowinning unit (EW), and melting furnace (MF). The kiln vent stack will be controlled with a Venturi scrubber (VS1) and carbon filter (CF1). The furnace vent stack will be controlled with a baghouse (BH1) and carbon filter (CF2). The electrowinning unit and mercury retort will share a common stack and be controlled with a carbon filter (CF3); mercury retort emissions will pass through a condenser (CD1) before reaching the filter. Lime silo unloading was modeled as a volume source. Leach circuit tanks were modeled as area sources. The remaining refinery sources, including lime silo loading, were modeled as point sources.

3.4 Tailings Facility

Byproducts of the CIL process are pre-treated and piped to a tailings storage facility (TEU/model ID TSF) and reclaim pond (TEU/model ID POND) as an aqueous solution, where it slowly dries. Evaporation of the solution releases hydrogen cyanide (HCN) to the atmosphere, which is a function of the temperature of the solution, ambient temperature, wind speed, and surface area. Emissions estimates were calculated on a monthly basis to account for changes in ambient temperature.

3.5 Miscellaneous Sources

3.5.1 Batch Plant

A cement batch plant will be positioned adjacent to the main underground mine entry portal to produce cemented rockfill (CRF) for backfilling underground mine drifts. Five emission points were characterized, including silo loading (TEU/model ID CEM1), unloading to batch plant (CEM2), aggregate (crushed borrow material or waste rock) transfer (CEM3), weigh hopper loading (CEM4), and central mixer loading (CEM5). Similar to the lime silo, CEM1 was modeled as a point source, the remainder as fugitive (volume) sources.

3.5.2 Emergency Generator and Fire Pump

A 2000 kW emergency diesel generator (TEU/model ID EDG1) and an emergency fire pump (EDFP) will be on-site and each limited to 100 hours of annual operation. Emissions estimates included cold starts.

3.5.3 HVAC Units

Several buildings will be at the facility and will be propane-fired heating, ventilation, and air conditioning (HVAC) units. Each were sized according to building footprint and assumed to run continuously throughout the year.

3.5.4 Storage Tanks

Two diesel (TEU/model IDs TD1 and TD2) and one gasoline (TG1) aboveground storage tanks will be housed at the facility. The annual throughput rates were estimated to be 120,000 gal, 240,000 gal, and 15,000 gal respectively based on fleet and equipment utilization. Emissions were derived using the United States Environmental Protection Agency (EPA) TANKS emissions estimation software, version 4.0.9d.

3.6 Insignificant Sources

Categorically insignificant sources are listed in Table 3-1. The "Source ID" column identifies sources included in the emissions inventory worksheets or characterized in Figure 4-1 but not considered significant TEUs. Details about each source were taken from "Grassy Mountain Project, Oregon, USA, NI 43-101 Technical Report on Feasibility Study" prepared by Ausenco (2020) unless otherwise noted. The completed Form AQ523 is included as Appendix F in the RAWP[2].

[2] Air Sciences. 2022. Grassy Mountain Mine Air Quality Modeling Protocol and Risk Assessment Work Plan. August 1, 2022. The RAWP was revised to address a comment in DEQ's approval letter dated June 28, 2022.

Table 3-1. Categorically Insignificant Sources List

Source ID	Source Description	Details
N/A	Evaporative and tail pipe emissions from on-site motor vehicle operation	Aboveground nonroad vehicles.
N/A	Office activities	Administration building: Single level modular wood frame, 8,800 ft^2. Will be serviced with power, water, HVAC, communications. Contractor office and laydown area: Modular trailer with an area of 160 ft^2
N/A	Janitorial activities	Routine janitorial activities will be occurring as needed.
N/A	Grounds keeping activities, including but not limited to building painting and road and parking lot maintenance	Seasonal road maintenance is anticipated to be sufficient to provide initial access to the site for all personnel and any deliveries related to the mine site and construction. The road will be upgraded for year-round activities during mine construction.
N/A	Automotive storage garages	Truck workshop and warehouse: Pre-engineered steel-frame and metal-clad building with an area of 6,250 ft^2. Will be positioned adjacent to the administration building. Will be divided into two sections, one for warehousing spare parts and tool storage and the other for a maintenance workshop. A bridge crane will be included.
N/A	Refrigeration systems with less than 50 pounds of charge of ozone-depleting substances regulated under Title IV	Not specifically identified but may be present.
N/A	Temporary construction activities	Construction period of 18 months beginning March 1st, 2022 to build tailings storage and waste rock dump facilities.
N/A	Warehouse activities	Process plant workshop and warehouse: Metal clad building approximately 2,540 ft^2.
N/A	Accidental fires and fire suppression	Fire safety systems: fire suppression, detection, and protection systems.
N/A	Electric motors	These have not been specifically identified but are anticipated to be present.
N/A	Pressurized tanks containing gaseous compounds	These have not been specifically identified but may be present in the workshop or laboratory.
N/A	Storm water settling basins	An EPA-compliant Stormwater Pollution Prevention Plan will be in place. The portal pad was designed with a 1% inclination toward outside, to allow stormwater to flow away from the portal and toward the stormwater drainage ditches.

Source ID	Source Description	Details
HR	Hazardous air pollutant emissions in fugitive dust from paved and unpaved roads, except for those sources that have processes or activities that contribute to the deposition and entrainment of hazardous air pollutants from surface soil	Borrow pit haul roads: 1.02 mi. Underground hauling: 1.62 mi. Process area hauling: 0.89 mi.
N/A	Health, safety, and emergency response activities	Two mobile emergency refuge stations will be provided in case of fire or rockfalls that would block access and prevent full evacuation of personnel. These refuges will allow the staff to remain safe in the underground mine for 48 hours. Each can accommodate up to 20 people within the protected chamber.

4.0 AIR DISPERSION MODELING METHODS

4.1 Model Selection

The risk assessment was conducted using version 22112 of the AERMOD modeling system. The AERMOD modeling system is the recommended model for short-range analyses (up to 50 kilometers) in the Guideline on Air Quality Models, which is maintained by the United States EPA and published as Appendix W to the Code of Federal Regulations, Title 40, Part 51.

Electronic copies of the AERMOD input, output, and other associated files are provided on digital media in Appendix B.

4.2 Source Characterization and Model Input Parameters

The model input parameters for each source are presented in Appendix A. A facility plot plan showing the project boundary and layout of sources is provided in Figure 4-1; a closer view of the refinery is shown in Figure 4-2. For references and additional details regarding source characterization, the reader is referred to Appendix E of the RAWP[3].

4.2.1 Volume and Point Sources

All the sources with stacks were characterized as point sources in the model. An exhaust temperature of 0˚K was used for sources not associated with heated processes (e.g., silo vents). AERMOD substitutes a 0˚K exhaust temperature with the hourly ambient temperature provided in the meteorological data for dispersion calculations.

All process fugitive sources without a stack (e.g., crushing) were characterized as volume sources. The initial lateral and vertical dispersion parameters are calculated based on approximate source dimensions and coefficients provided in EPA guidance.[4]

4.2.2 Underground Mining Sources

Emissions from underground mining activities include fugitive dust from drilling, blasting, and materials handling, and tailpipe emissions from nonroad mobile equipment. Tailpipe emissions from nonroad engines are included in the CAO risk analysis at the request of the Oregon DEQ. The inclusion of these emissions results in a highly conservative analysis because, 1) nonroad

[3] Air Sciences. 2022. Grassy Mountain Mine Air Quality Modeling Protocol and Risk Assessment Work Plan. August 1, 2022. The RAWP was revised to address a comment in DEQ's approval letter dated June 28, 2022.

[4] EPA. 2016. User's Guide for the AMS/EPA Regulatory Model (AERMOD). EPA-454/B-16-011. December 2016.

engines are excluded from the definition of "stationary sources"[5] and 2) states are preempted from enforcing emission control standards for nonroad engines.[6]

The Mine Safety and Health Administration (MSHA)-compliant ventilation system will continuously draw fresh air into the mine and exhaust "stale" air from a single vent at the surface. This vent was characterized as a single point source located at and using stack parameters consistent with the ventilation system design.

4.2.3 Haul Road Source Characterization

The project's haul road emissions are from fugitive dust source and nonroad mobile tailpipes. Nonroad mobile tailpipe emissions are not stationary sources and therefore are exempt from consideration under the CAO program (see Section 4.2.2). Fugitive dust from unpaved roads is considered categorically insignificant per OAR 340-200-0020 (23)(ss). Therefore, emissions from haul roads are not included in the TAC emissions inventory for CAO or TAC modeling.

4.2.4 Area Sources

Several fugitive emissions sources were characterized as area sources, including emissions at the topsoil storage locations; general mining activity across the borrow site; the tailings management facility; the tailings reclaim pond; the CIL tanks; and cyanide detoxification tanks. For these sources whose emission location extents are not rectangular, the area sources were characterized as rectangular approximations of the locations.

4.3 Coordinate System

The Universal Transverse Mercator (UTM) coordinate system projected in North American Datum of 1983 (NAD83), Zone 11, was used in the modeling analysis to define all locations in the modeling domain (sources, buildings, and receptors).

4.4 Building Downwash

The effects of the building-induced downwash were incorporated into this modeling analysis (see Figure 4-3 for a 3D perspective of the modeled building layout). The building downwash parameters were calculated using the Building Profile Input Program (BPIP) with the Plume Rise Model Enhancement (PRIME) algorithm (BPIP-PRIME version 04274). The building parameters used in the modeling are provided in a BPIP-ready format in Appendix B.

---

[5] 42 U.S.C. §7602(z) Stationary Source.—The term "stationary source" means generally any source of an air pollutant except those emissions resulting directly from an internal combustion engine for transportation purposes or from a nonroad engine or nonroad vehicle as defined in section 7550 of this title.

[6] 40 CFR § 1074.10 Scope of preemption. (b) For nonroad engines or vehicles other than those described in paragraph (a) of this section and § 1074.12, States and localities are preempted from enforcing any standards or other requirements relating to control of emissions from nonroad engines or vehicles except as provided in subpart B of this part.

Figure 4-1. Model Source Locations for Grassy Mountain Mine Facility

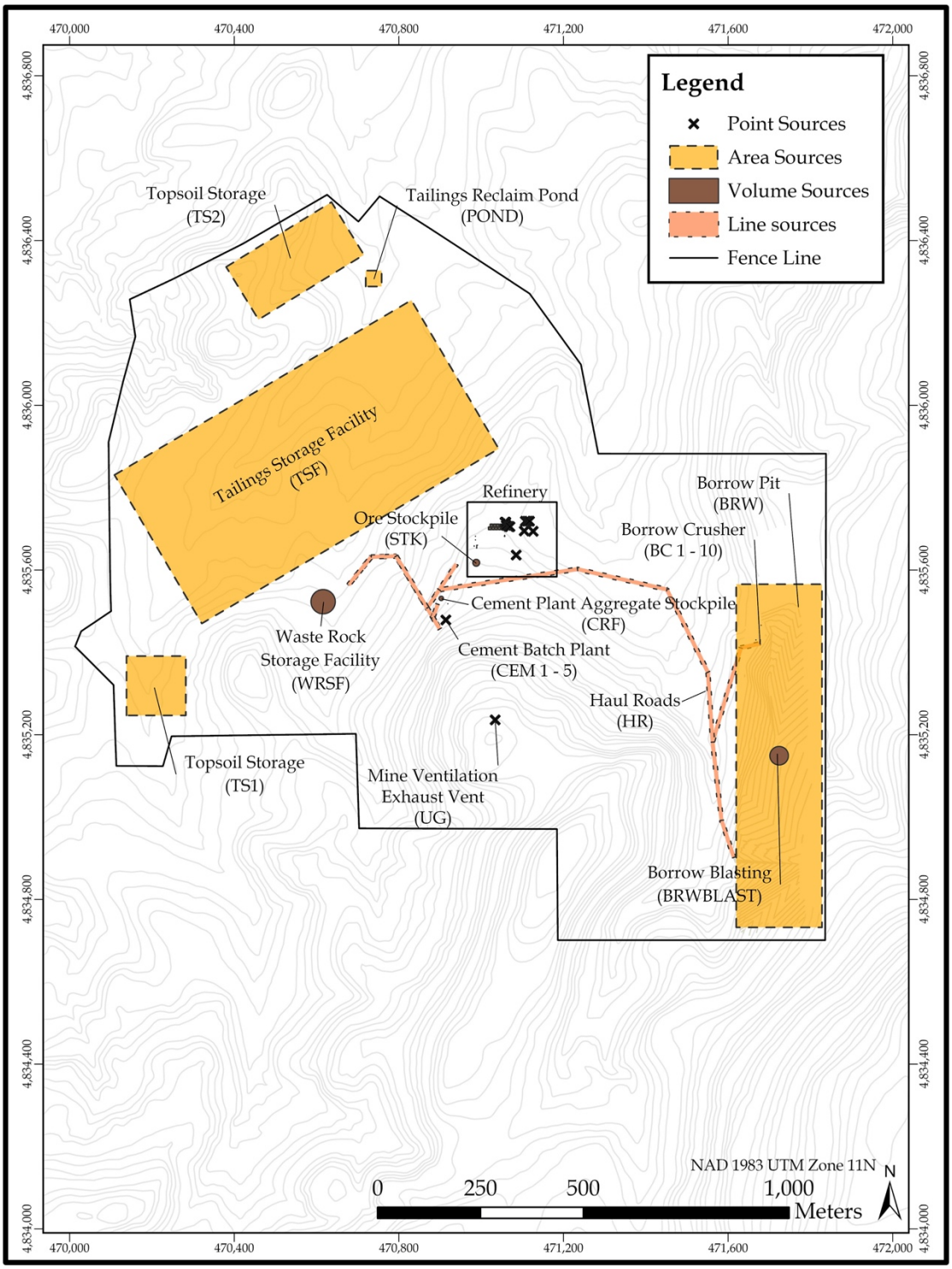


Figure 4-2. Model Source Locations for Grassy Mountain Mine Refinery

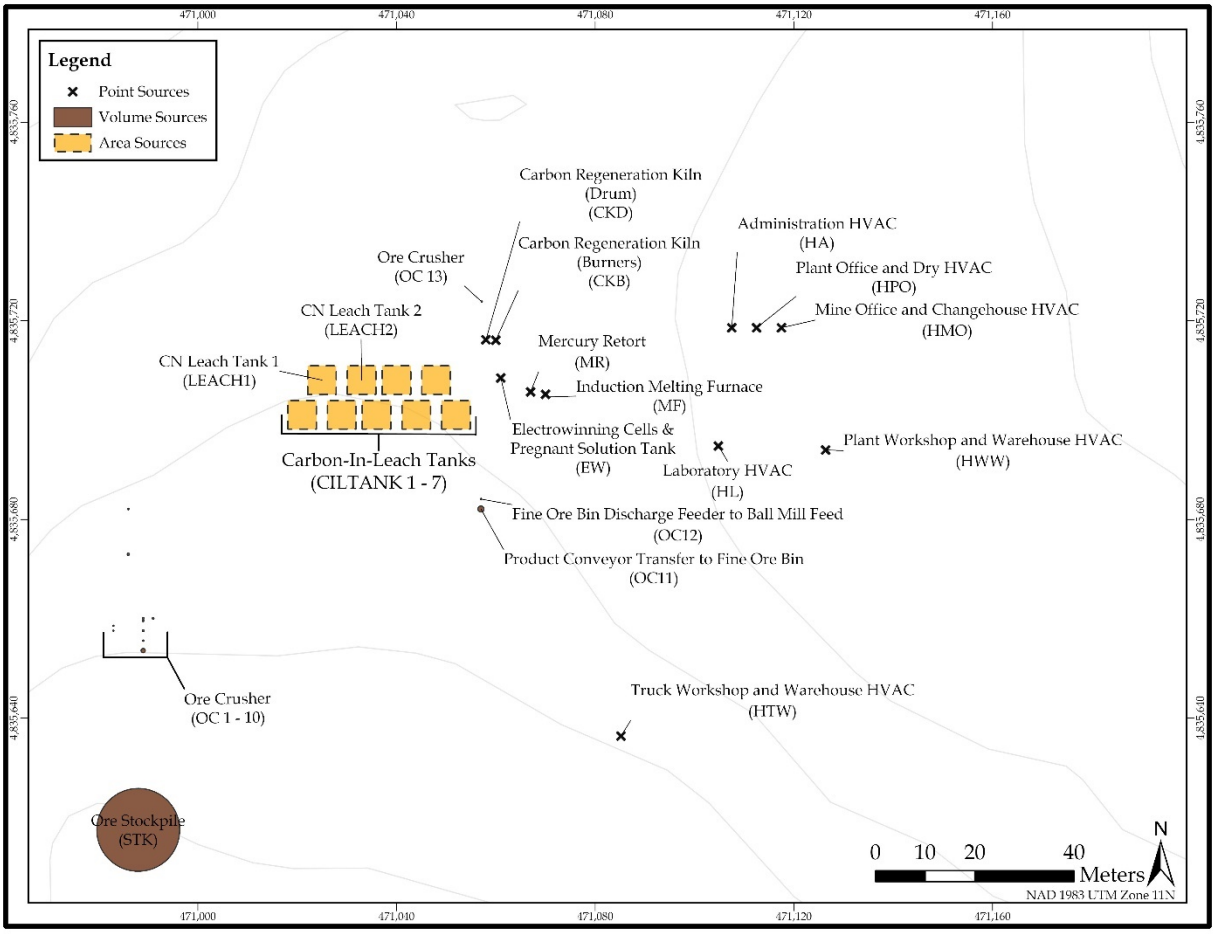
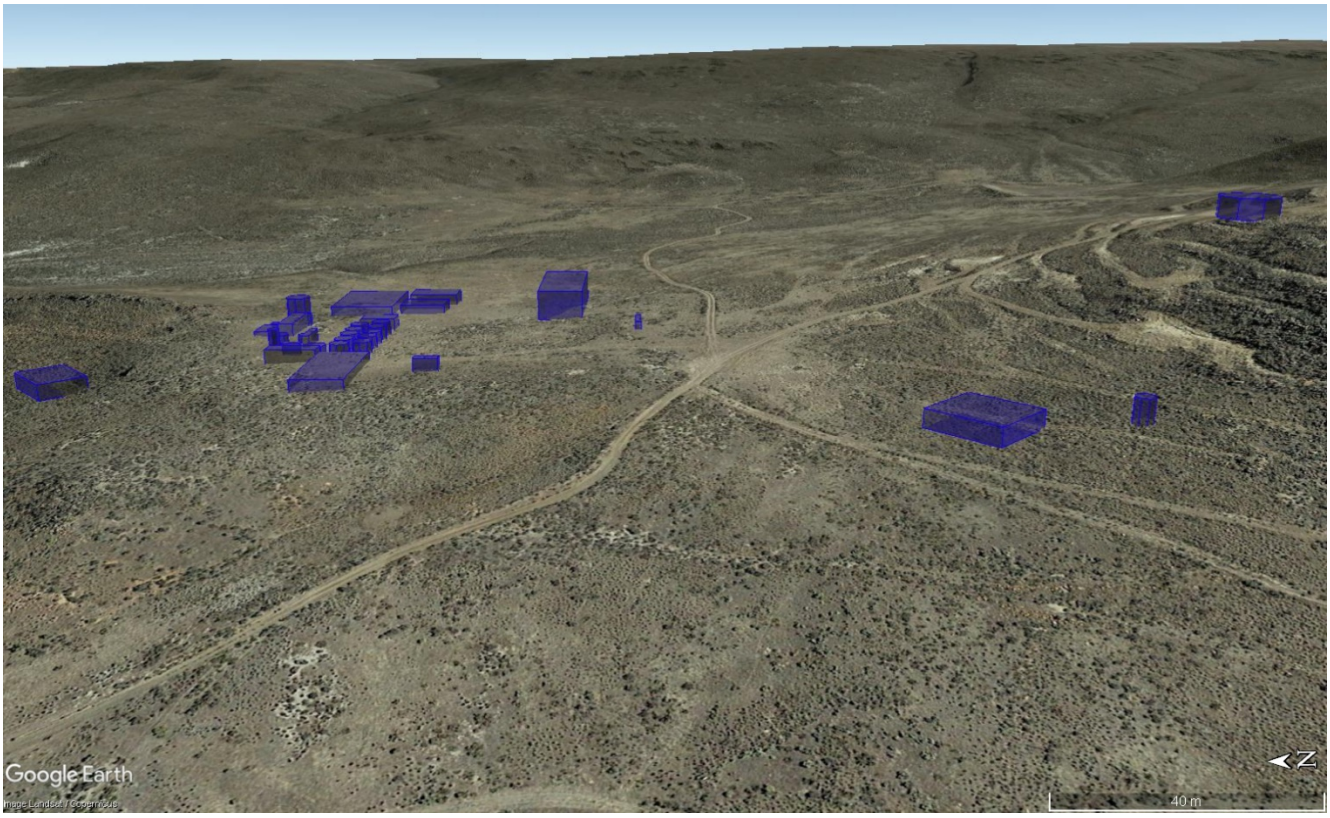


Figure 4-3. Perspective View of Refinery Area Model Buildings Included for Downwash



4.5 Receptors

A series of nested Cartesian receptor grids were used to assess ground-level impacts from the facility air emissions:

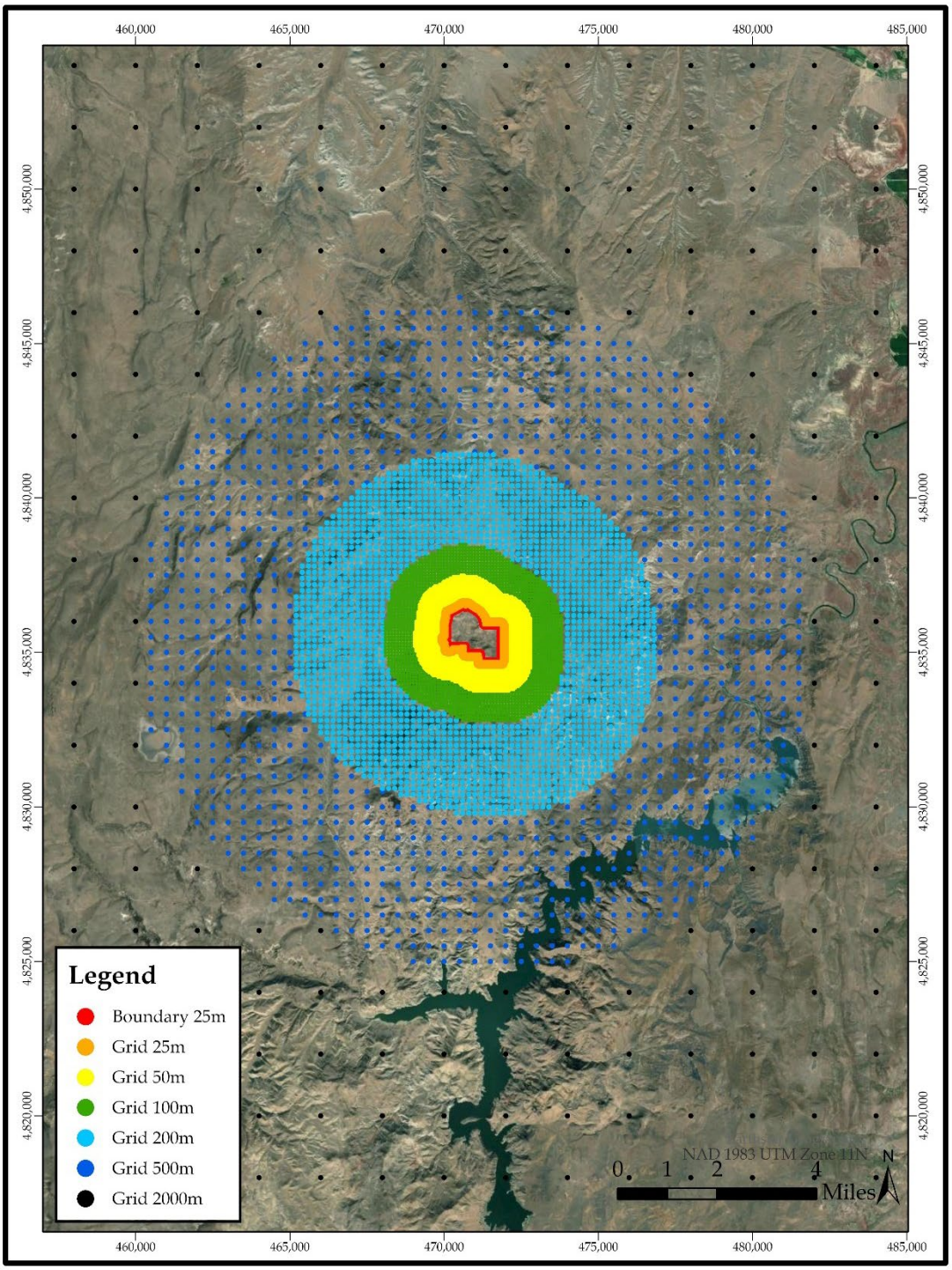
- Boundary line receptors at 25-meter spacing
- Gridded receptors at 25-meter spacing out to 200 meters from the modeling boundary
- Gridded receptors at 50-meter spacing out to 1 kilometer from the modeling boundary
- Gridded receptors at 100-meter spacing out to 2 kilometers from the modeling boundary
- Gridded receptors at 200-meter spacing out to 5 kilometers from the modeling boundary
- Gridded receptors at 500-meter spacing to 10 kilometers from the modeling boundary
- Gridded receptors at 2-kilometer spacing to 50 kilometers from the modeling boundary

All the above grids are centered on the facility. Receptors within the project boundary were not modeled. The receptor locations are shown in Figure 4-4. Additional receptors were modeled for the risk assessment and are discussed in Section 5.2.2.

All receptors were processed with the AERMOD terrain preprocessor (AERMAP, version 18081) to generate receptor terrain elevations and hill height values using the one-third-arc-

second (10-meter) resolution United States Geographical Survey National Elevation Dataset (NED) files.

Figure 4-4. Receptor Locations

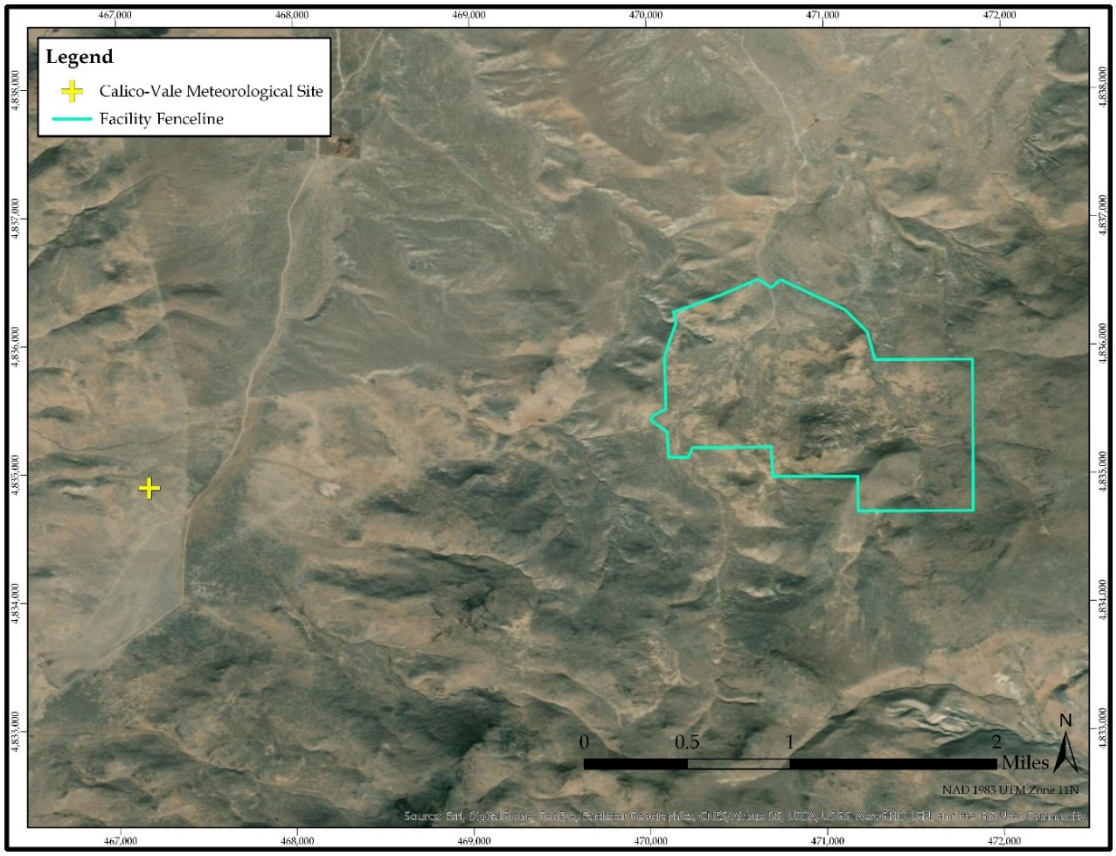


4.6 Meteorological Data

The air quality modeling was conducted using one year (2014/10/01–2015/09/30) of site-specific hourly meteorological data. The meteorological data were collected at the Calico-Vale meteorological station as part of the Air Quality Baseline study for the facility project area (Baseline Study).[7] The site is located approximately four kilometers west of the facility project area, as shown in Figure 4-5. A wind frequency distribution diagram (wind rose) for the meteorological data is presented in Figure 4-6. The data quality meets or exceeds all specifications described in the Environmental Protection Agency's (EPA's) Meteorological Monitoring Guidance for Regulatory Modeling Applications.[8]

The data set was processed with AERMET version 22112, supplemented with upper-air data from Boise, ID, and National Weather Service (NWS) surface station data, including cloud cover, from Ontario, OR. The processing included the AERMET stage 3 adjusted surface friction velocity option (ADJ_U*).

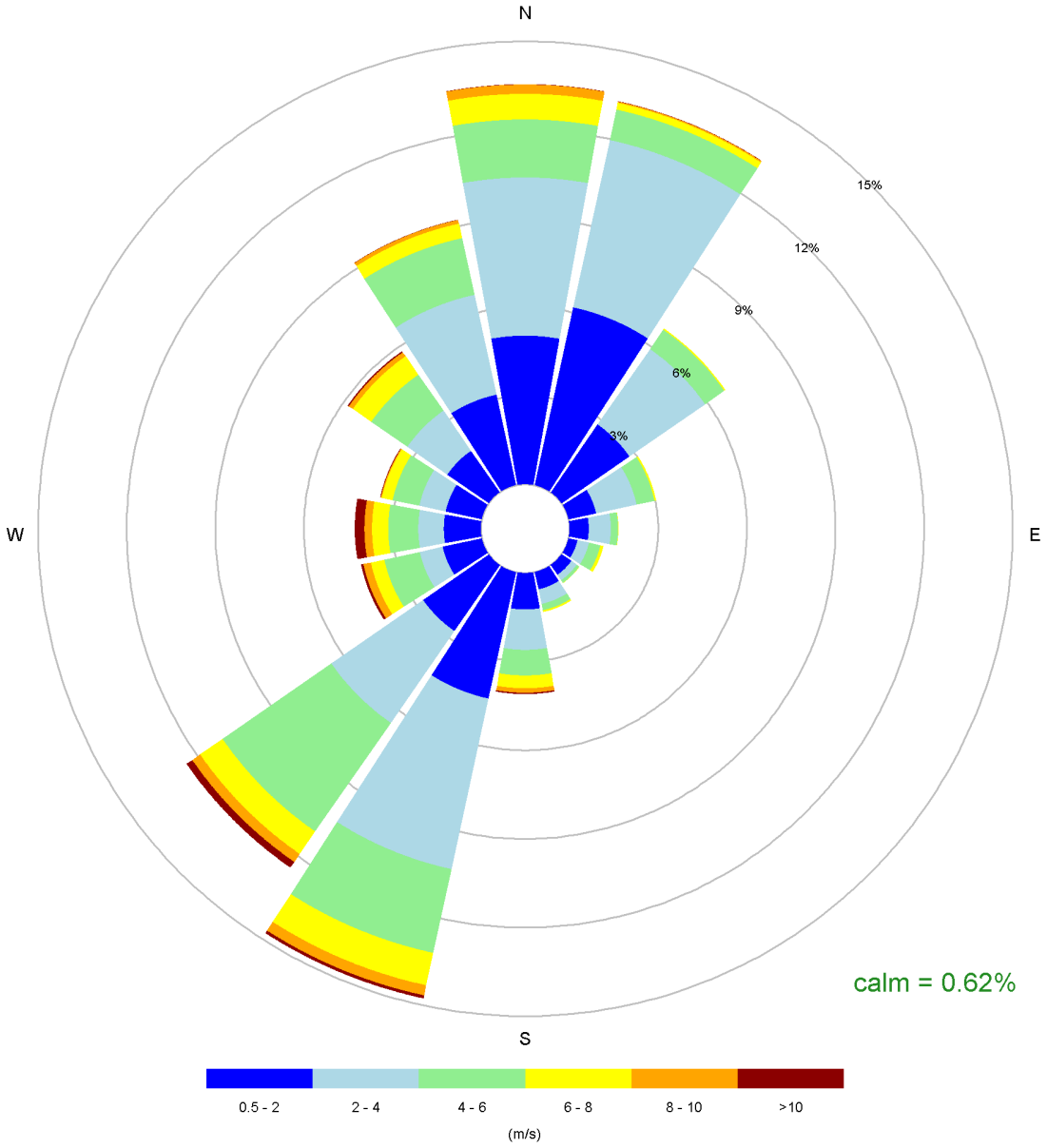
Figure 4-5. Calico-Vale Meteorological Tower Location



[7] EM Strategies. 2018. Grassy Mountain Mine Project Air Quality Resources Baseline Report. January, 2018.

[8] EPA. 2000. Meteorological Monitoring Guidance for Regulatory Modeling Applications. EPA-454/R-9905. February, 2000.

Figure 4-6. Wind Rose for the Calico-Vale Meteorological Station



5.0 RISK ASSESSMENT METHODOLOGY

5.1 Level 3 Risk Assessment

As part of the application for the Standard ACDP, a CAO Level 3 Risk Assessment was performed for the facility. The Risk Assessment used the modeling procedures described in the Section 4.0. This section provides additional information regarding a conceptual site model for exposure, the exposure assessment and risk characterization, and an uncertainty evaluation.

5.2 Conceptual Site Model

5.2.1 Toxic Emissions

For the risk assessment, toxic emissions impacting the inhalation pathway are expected to occur from the following facility activities described in Section 2.0:

- Propane combustion, including combustion at the carbon regeneration kiln and assuming all building heaters are propane fired
- Toxic pollutants found in the dust emitted from site activities, including ore and waste rock crushing, rock drilling, rock blasting, material transfers, and wind erosion
- Mercury emissions from the following process sources: kiln, electrowinning circuit, mercury retort, and melting furnace
- Hydrogen cyanide emissions from CIL tanks, cyanide detoxification tanks, and the tailings management facility
- Cement silo filling and cement truck loading

Tailpipe emissions from nonroad equipment operating underground were also considered. These emissions are from mobile sources and are exempt from consideration under the CAO program but are being considered at the request of Oregon DEQ (see Section 4.2.2).

A summary of facility-wide potential emissions of TACs is provided in Table 5-1. Potential emissions of TACs by individual TEU are provided in Appendix C. Detailed emissions calculations for these are provided as Form AQ520 and in the emissions inventory[9]. The conceptual site model for the CAO is summarized in Figure 5-1.

[9] Air Sciences. 2022. Grassy Mountain Mine Air Quality Modeling Protocol and Risk Assessment Work Plan. August 1, 2022. The RAWP was revised to address a comment in DEQ's approval letter dated June 28, 2022.

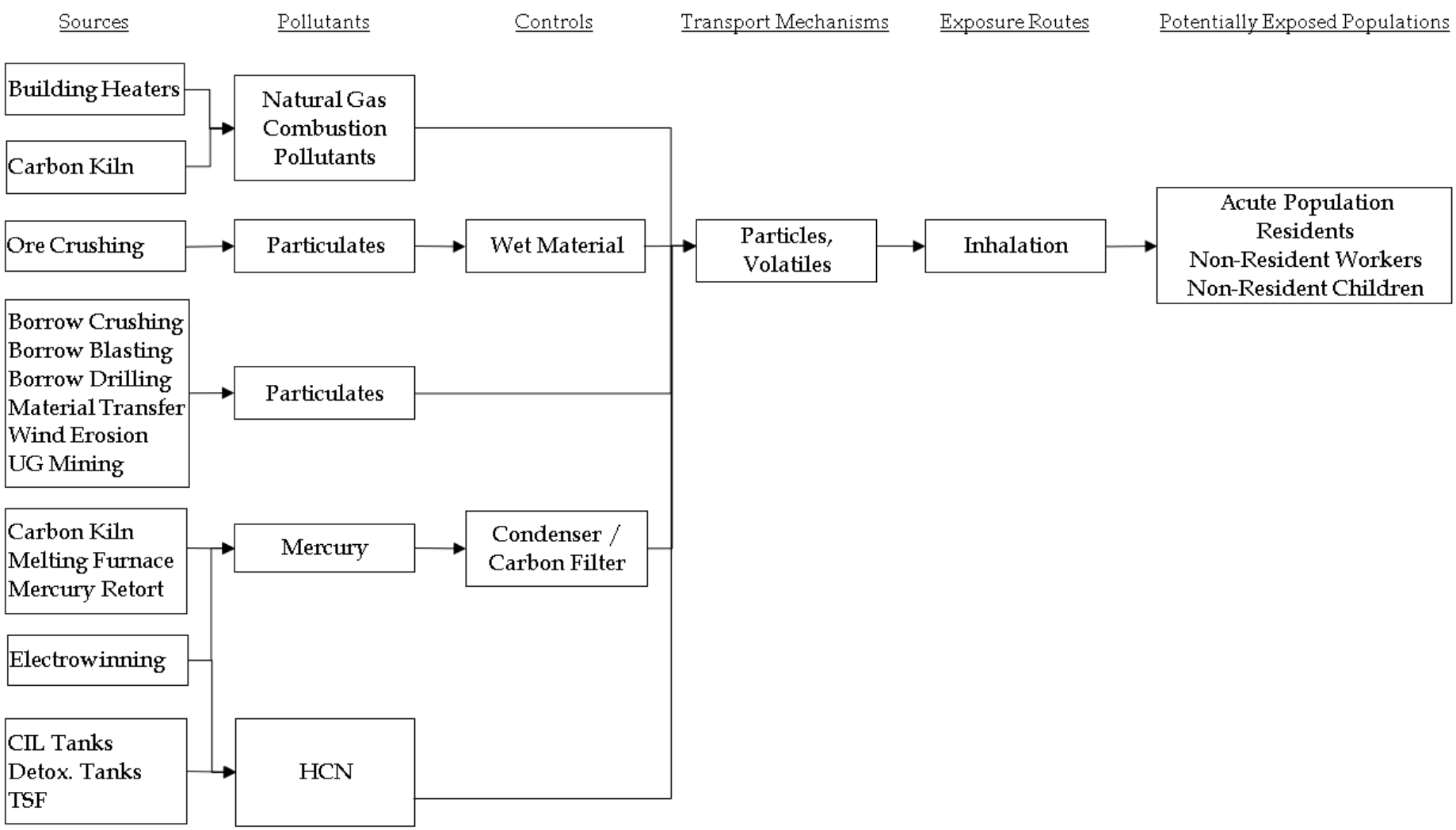
Table 5-1. Facility-Wide Potential Emissions of TACs and Risk-Based Concentrations (RBC)

CAS or DEQ ID	TAC	Residential Chronic		Non-Residential Chronic				Acute	Facility Total	
		Cancer RBC	Non-cancer RBC	Child Cancer RBC	Child Non-cancer RBC	Worker Cancer RBC	Worker Non-cancer RBC	Non-cancer RBC		
		(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(ton/year)	(pound/day)
7440-36-0	Antimony and compounds		3.0E-1		1.3E+0		1.3E+0	1.0E+0	5.5E-4	4.8E-3
7440-38-2	Arsenic and compounds	2.4E-5	1.7E-4	1.3E-3	2.4E-3	6.2E-4	2.4E-3	2.0E-1	1.8E-3	2.2E-2
7440-41-7	Beryllium and compounds	4.2E-4	7.0E-3	1.1E-2	3.1E-2	5.0E-3	3.1E-2	2.0E-2	2.2E-5	1.9E-4
7440-43-9	Cadmium and compounds	5.6E-4	5.0E-3	1.4E-2	3.7E-2	6.7E-3	3.7E-2	3.0E-2	1.7E-4	6.9E-3
18540-29-9	Chromium VI, chromate, and dichromate particulate	3.1E-5	8.3E-2	5.2E-4	8.8E-1	1.0E-3	8.8E-1	3.0E-1	3.3E-4	3.2E-3
7440-48-4	Cobalt and compounds		1.0E-1		4.4E-1		4.4E-1		3.2E-5	2.7E-4
7439-92-1	Lead and compounds		1.5E-1		6.6E-1		6.6E-1	1.5E-1	8.6E-4	3.8E-2
7439-96-5	Manganese and compounds		9.0E-2		4.0E-1		4.0E-1	3.0E-1	1.4E-3	2.4E-2
7439-97-6	Mercury and compounds		7.7E-2		6.3E-1		6.3E-1	6.0E-1	4.4E-3	9.8E-2
C365	Nickel compounds, insoluble	3.8E-3	1.4E-2	1.0E-1	6.2E-2	4.6E-2	6.2E-2	2.0E-1	4.8E-4	1.8E-2
7440-39-3	Barium and compounds								8.5E-3	7.4E-2
7440-50-8	Copper and compounds							1.0E+2	5.3E-4	2.0E-2
7440-62-2	Vanadium (fume or dust)		1.0E-1		4.4E-1		4.4E-1	8.0E-1	3.0E-4	2.4E-3
7440-66-6	Zinc and compounds								3.1E-3	1.1E-1
1313-27-5	Molybdenum trioxide								8.1E-5	7.2E-4
7440-22-4	Silver and compounds								3.5E-5	3.4E-4
7631-86-9	Silica, crystalline (respirable)		3.0E+0		1.3E+1		1.3E+1		3.2E+0	3.1E+1
115-07-1	Propylene		3.0E+3		1.3E+4		1.3E+4		5.7E-2	2.2E+0
106-99-0	1,3-Butadiene	3.3E-2	2.0E+0	8.6E-1	8.8E+0	4.0E-1	8.8E+0	6.6E+2	2.0E-2	9.6E-1
75-05-8	Acetonitrile		6.0E+1		2.6E+2		2.6E+2		6.0E-3	5.6E-2
107-02-8	Acrolein		3.5E-1		1.5E+0		1.5E+0	6.9E+0	4.4E-3	1.7E-1
67-64-1	Acetone		3.1E+4		1.4E+5		1.4E+5	6.2E+4	4.1E-4	3.8E-3
67-63-0	Isopropyl alcohol		2.0E+2		8.8E+2		8.8E+2	3.2E+3	7.8E-4	7.3E-3
107-13-1	Acrylonitrile	1.5E-2	5.0E+0	3.8E-1	2.2E+1	1.8E-1	2.2E+1	2.2E+2	1.1E-3	1.1E-2
71-43-2	Benzene	1.3E-1	3.0E+0	3.3E+0	1.3E+1	1.5E+0	1.3E+1	2.9E+1	4.1E-2	9.8E-1
108-88-3	Toluene		5.0E+3		2.2E+4		2.2E+4	7.5E+3	7.8E-2	8.5E-1
100-41-4	Ethyl benzene	4.0E-1	2.6E+2	1.0E+1	1.1E+3	4.8E+0	1.1E+3	2.2E+4	1.6E-2	1.3E-1
100-42-5	Styrene		1.0E+3		4.4E+3		4.4E+3	2.1E+4	5.4E-4	5.1E-3

108-67-8	1,3,5-Trimethylbenzene		6.0E+1		2.6E+2		2.6E+2		1.7E-4	1.6E-3
91-20-3	Naphthalene	2.9E-2	3.7E+0	7.6E-1	1.6E+1	3.5E-1	1.6E+1	2.0E+2	7.1E-3	1.2E-1
7782-49-2	Selenium and compounds							2.0E+0	2.1E-4	9.9E-3
91-57-6	2-Methyl naphthalene								9.6E-7	8.6E-6
56-49-5	3-Methylcholanthrene								5.4E-8	3.0E-7
57-97-6	7,12-Dimethylbenz[a]anthracene								4.8E-7	2.6E-6
83-32-9	Acenaphthene								3.0E-4	1.5E-2
208-96-8	Acenaphthylene								3.6E-4	1.8E-2
75-07-0	Acetaldehyde	4.5E-1	1.4E+2	1.2E+1	6.2E+2	5.5E+0	6.2E+2	4.7E+2	7.1E-2	3.5E+0
7664-41-7	Ammonia		5.0E+2		2.2E+3		2.2E+3	1.2E+3	8.1E-1	1.6E+1
120-12-7	Anthracene								3.6E-4	1.8E-2
56-55-3	Benz[a]anthracene	2.1E-4		7.8E-3		1.5E-2			3.5E-4	1.7E-2
50-32-8	Benzo[a]pyrene	4.3E-5	2.0E-3	1.6E-3	8.8E-3	3.0E-3	8.8E-3	2.0E-3	3.2E-6	1.6E-4
205-99-2	Benzo[b]fluoranthene	5.3E-5		2.0E-3		3.8E-3			6.0E-4	3.0E-2
191-24-2	Benzo[g,h,i]perylene	4.7E-3		1.7E-1		3.4E-1			3.1E-7	1.3E-5
207-08-9	Benzo[k]fluoranthene	1.4E-3		5.2E-2		1.0E-1			6.0E-4	3.0E-2
218-01-9	Chrysene	4.3E-4		1.6E-2		3.0E-2			3.2E-4	1.6E-2
53-70-3	Dibenz[a,h]anthracene	4.3E-6		1.6E-4		3.0E-4			3.1E-4	1.5E-2
206-44-0	Fluoranthene	5.3E-4		2.0E-2		3.8E-2			3.6E-4	1.8E-2
86-73-7	Fluorene								1.9E-3	9.3E-2
50-00-0	Formaldehyde	1.7E-1	9.0E+0	4.3E+0	4.0E+1	2.0E+0	4.0E+1	4.9E+1	1.6E-1	7.6E+0
110-54-3	Hexane		7.0E+2		3.1E+3		3.1E+3		1.2E-1	7.8E-1
193-39-5	Indeno[1,2,3-cd]pyrene	6.1E-4		2.2E-2		4.3E-2			3.1E-4	1.5E-2
106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)	9.1E-2	6.0E+1	2.4E+0	2.6E+2	1.1E+0	2.6E+2	1.2E+4	3.6E-5	2.0E-4
85-01-8	Phenanthrene								3.5E-3	1.7E-1
129-00-0	Pyrene								7.6E-4	3.7E-2
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		2.2E+2		9.7E+2		9.7E+2	8.7E+3	1.1E-1	2.2E+0
74-90-8	Cyanide, Hydrogen		8.0E-1		3.5E+0		3.5E+0	3.4E+2	1.9E+0	1.2E+1
12185-10-3	Phosphorus, white		9.0E+0		4.0E+1		4.0E+1	2.0E+1	2.8E-5	2.5E-4
108-90-7	Chlorobenzene		5.0E+1		2.2E+2		2.2E+2		1.8E-5	8.9E-4
7647-01-0	Hydrochloric Acid		2.0E+1		8.8E+1		8.8E+1	2.1E+3	1.7E-2	8.3E-1
C200	Diesel Particulate Matter	1.0E-1	5.0E+0	2.6E+0	2.2E+1	1.2E+0	2.2E+1		3.7E+0	2.9E+2
192-97-2	Benzo[e]pyrene								2.4E-8	4.6E-7
198-55-0	Perylene								4.6E-8	8.9E-7

92-52-4	Biphenyl					9.7E-5	5.3E-4
110-82-7	Cyclohexane	6.0E+3	2.6E+4	2.6E+4		2.2E-3	1.2E-2
108-95-2	Phenol	2.0E+2	8.8E+2	8.8E+2	5.8E+3	5.1E-4	2.8E-3
95-63-6	1,2,4-Trimethylbenzene	6.0E+1	2.6E+2	2.6E+2		2.3E-2	1.3E-1
98-82-8	Isopropylbenzene (Cumene)	4.0E+2	1.8E+3	1.8E+3		4.6E-3	2.5E-2

Figure 5-1. CAO Conceptual Site Model Diagram



5.2.2 Exposure Locations

For the risk assessment, the gridded receptors presented in Section 4.5 were compared with land use data to determine which receptors represent the following types of locations (and potentially exposed population types):

- Acute open space (acute population)
- Residential (residents)
- Commercial (non-resident workers)
- Schools (non-resident children)

The classification of the receptors within the gridded receptor networks in shown in Figure 5-2.

In addition, receptors were modeled to represent specific population locations, including the closest campgrounds, residences, businesses, and schools. A list of all non-acute classified receptors is provided in Appendix D; the non-acute receptors nearest the facility are listed in Table 5-2. The locations and classifications of all receptors are shown in Figure 5-2 and Figure 5-3 and provided as a digital attachment to this document in 6.1Appendix B.

Table 5-2. Nearest Exposure Locations by Risk Class

Easting	Northing	Risk Classification	OR Zoning Code	Zoning Description
466000.0	4886000.0	Residential	RNG	Federal Range
468000.0	4886000.0	Residential	EFU80	Exclusive Farm Use 80
504000.0	4874000.0	Residential	MHDR	Medium High Density Residential
467702.0	4839557.0	Worker	RNG	Federal Range
474243.0	4839495.0	Worker	RNG	Federal Range
466286.6	4829470.7	Worker	RNG	Federal Range
451130.0	4857129.0	Child	RC	Residential-Commercial
480485.0	4869487.0	Child	MDR	Medium Density Residential
494402.0	4843162.0	Child	No zoning class	

The acute exposure hazard was calculated for all receptors in Oregon. Additionally, chronic cancer and chronic noncancer risks were calculated for those receptors representing residents, non-resident workers, and non-resident children. A description of the risk calculation is provided in Section 5.3.

Figure 5-2. Gridded Exposure Locations and Zoning

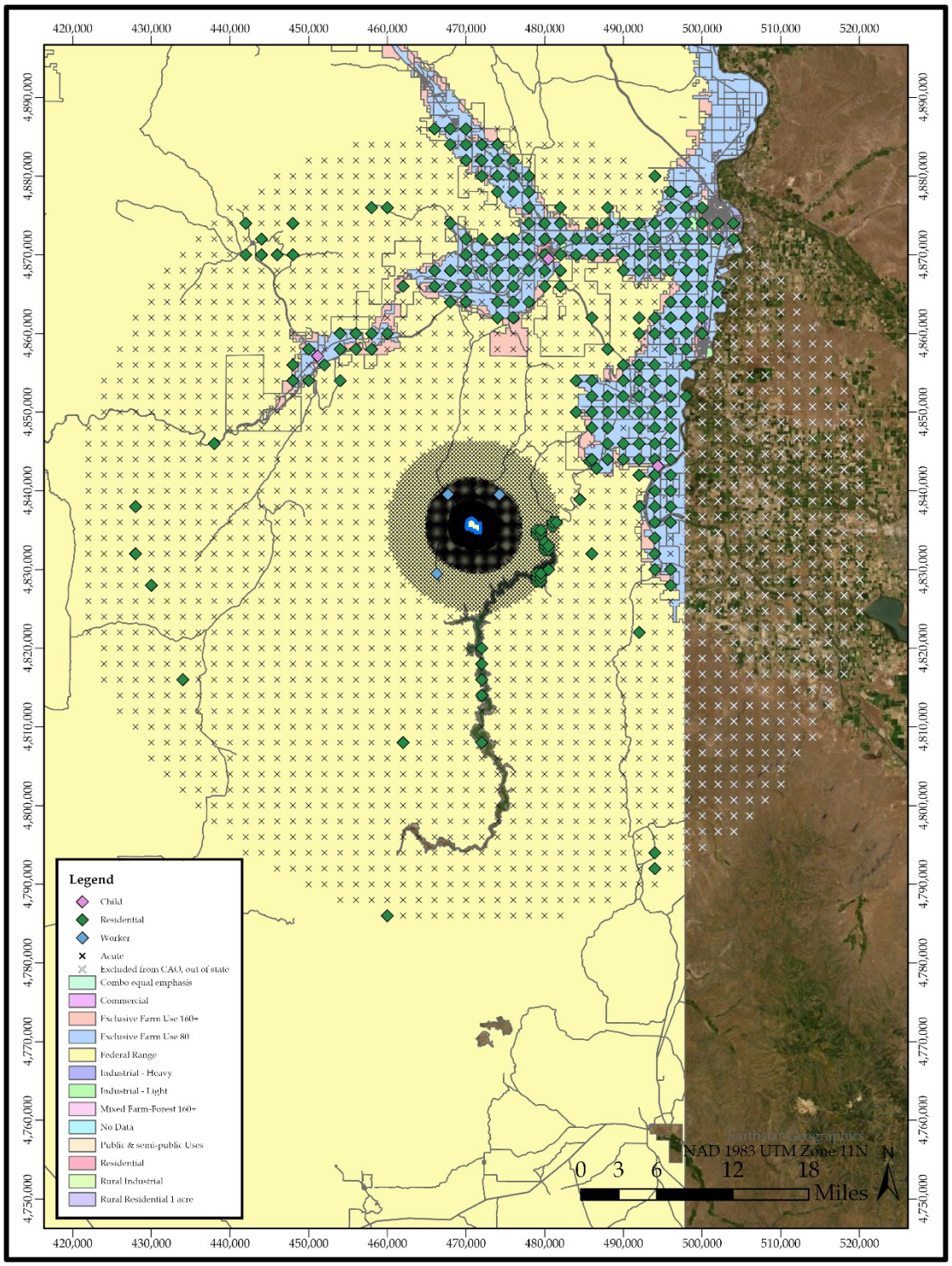
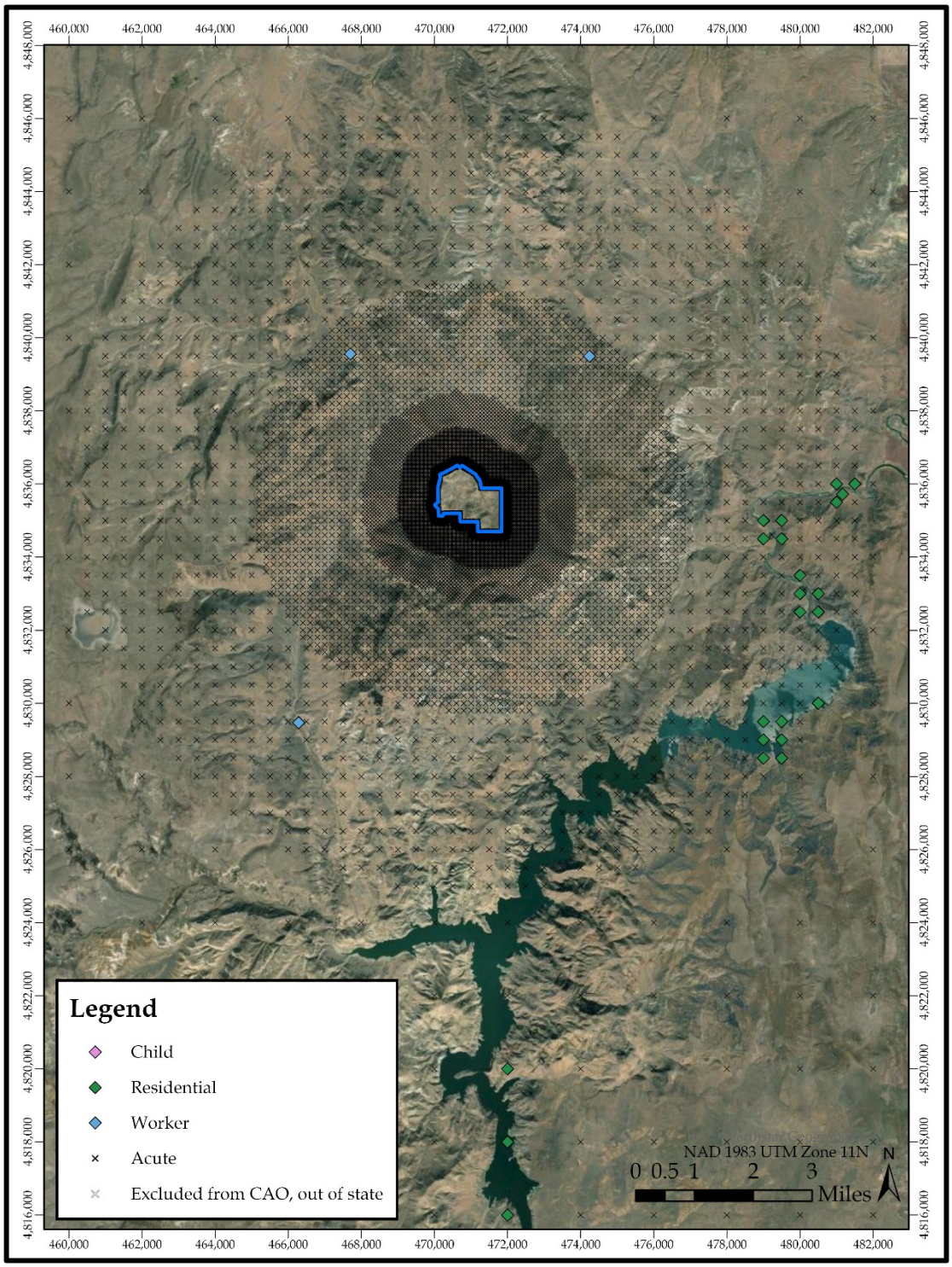


Figure 5-3. Exposure Locations Near the Proposed Facility Boundary



5.3 Exposure Assessment and Risk Characterization

Risk was estimated using AERMOD modeling and Method C Risk Equivalent Emission Rate (REER)[10]. The maximum total modeled risk impacts are based on the Risk-Based Concentrations (RBCs) provided in Table 5-1 to estimate the potential risks at the exposure locations identified in Section 5.2.2 for each exposure scenario.

The AERMOD modeling for the Level 3 risk assessment used the source characterizations, building downwash parameters, and meteorological data described Section 4.0.

For the CAO risk assessment modeling, the REER for each TEU was calculated by taking the sum of the ratios of the TAC emission rates to the respective RBCs for each exposure scenario. The calculation of REER by TEU is provided in Appendix E. The REER are assigned by TEU to the appropriate model sources for dispersion modeling with AERMOD. The resultant AERMOD output for an exposure scenario therefore represents a total risk at each receptor, rather than a concentration of any individual TAC.

Some TEUs in AQ520.2 represent multiple AERMOD sources, and some AERMOD sources represent multiple TEUs. For those TEUs which represent multiple sources, the REER was allocated to the associated sources for modeling. For sources which represent multiple TEUs, the total REER for the associated TEUs was modeled. A list of the TEUs, model sources, and allocation percentages is provided in Table 5-3.

For example, CAO TACs emissions are calculated for the ore crushing circuit source group (OC), based on the estimated total particulate matter (PM) emitted. Modeled sources for the OC group include sources OC1 through OC13, which represent individual material transfers and crusher emissions, and the PM emissions from each source are calculated in the emissions inventory. In the CAO model, the OC REER was allocated to the thirteen specific sources based on the portion of PM emitted by each source. In Table 5-3, OC8 is shown to have an allocation of 20.0%, which is the percentage of the OC group PM emissions emitted from OC8. In the CAO risk calculation, OC8 was assigned 20.0% of the OC TEU's REER.

Another example is the mine vent model source (UG). Emissions from the underground fugitive dust (UFD), underground diesel usage (UDP), underground blasting emulsion volatile organic compounds (UB), and underground blasting emulsion metals (UBD) TEUs were modeled as emitted from the UG source, so the total REER for those four TEUs was allocated to the UG source.

[10] Oregon DEQ. 2020. Recommended Procedures for Air Quality Dispersion Modeling. April 2020. Appendix A, Method C.

Table 5-3. TEU Modeling Sources and Allocation

TEU	SOURCE	Allocation
OC	OC1	2.3%
	OC2	2.3%
	OC3	20.0%
	OC4	2.3%
	OC5	36.7%
	OC6	2.3%
	OC7	2.3%
	OC8	20.0%
	OC9	2.3%
	OC10	2.3%
	OC11	2.3%
	OC12	2.3%
	OC13	2.3%
BC	BC1	5.3%
	BC2	5.3%
	BC3	9.5%
	BC4	5.3%
	BC5	5.3%
	BC6	5.3%
	BC7	44.0%
	BC8	9.5%
	BC9	5.3%
	BC10	5.3%
AFD	BRW	46.9%
	BRWBLAST	30.5%
	WRSF	7.1%
	CRF	7.5%
	STK	6.9%
	TS1	0.8%
	TS2	0.3%
BRWB	BRWBLAST	100%
BRWBD		100%
CKD	CKD	100%
CKDHG		100%
MFP	MF	100%
MFHG		100%
MFD		100%
UFD	UG	100%
UDP		100%
UB		100%
UBD		100%
MR	MR	100%
HA	HA	100%
HPO	HPO	100%

TEU	SOURCE	Allocation
HL	HL	100%
HWW	HWW	100%
HTW	HTW	100%
HMO	HMO	100%
EW	EW	100%
TSF	TSF	100%
POND	POND	100%
LEACH1	LEACH1	100%
LEACH2	LEACH2	100%
CILTANK1	CILTANK1	100%
CILTANK2	CILTANK2	100%
CILTANK3	CILTANK3	100%
CILTANK4	CILTANK4	100%
CILTANK5	CILTANK5	100%
CILTANK6	CILTANK6	100%
CILTANK7	CILTANK7	100%
CEM1	CEM1	100%
CEM2	CEM2	100%
CEM3	CEM3	100%
CEM4	CEM4	100%
CEM5	CEM5	100%
EDG1	EDG1	100%
EDFP	EDFP	100%
LS1	LS1	100%
LS2	LS2	100%
TG1	TG1	100%
TD1	TD1	100%
TD2	TD2	100%

REERs were calculated, and total risk modeled, for each exposure scenario using the appropriate RBCs. Maximum risk for each receptor and scenario were output to AERMOD plot files for daily or annual averaging periods. A daily plot file was used for the acute exposure analysis, and annual plot files used for the chronic cancer and chronic noncancer exposure analyses.

There are three risk types: chronic cancer risk, chronic noncancer risk, and acute risk. For informational purposes, the chronic risk values are grouped by exposure location type (residents, non-resident workers, and non-resident children). This results in seven risk levels being determined, and seven exposure scenarios were modeled.

The risk values are compared to the appropriate new facility Risk Action Levels (RALs), shown in Table 6.

Table 5-4. Risk Action Levels

Risk Action Level	Cancer	Noncancer
Source Permit Level	0.5	0.5
Community Engagement Level	5	1
Toxics Best Available Control Technology Level	10	1
Permit Denial Level	25	1

6.0 RISK ASSESSMENT RESULTS SUMMARY

The AERMOD dispersion modeling results and their comparison to the Source Permit Risk Action Level (RAL) values for cancer and noncancer are presented in Table 6-1.

Table 6-1. Risk Assessment Results

Risk Category	Exposure Scenario		Maximum Risk Location Easting (m)	Maximum Risk Location Northing (m)	Maximum Risk	Source Permit RAL
Cancer	Chronic	Residential	472000.0	4820000.0	0.18329	0.5
		Child	480485.0	4869487.0	0.00103	0.5
		Worker	474243.0	4839495.0	0.04890	0.5
Noncancer	Chronic	Residential	479000.0	4834500.0	0.01893	0.5
		Child	480485.0	4869487.0	0.00035	0.5
		Worker	474243.0	4839495.0	0.01513	0.5
	Acute		471268.3	4835965.9	0.27327	0.5

The risk assessment results show that the maximum risks for all exposure scenarios fall within the Source Permit Risk Action Level.

Risk contour maps for each exposure scenario are shown in Figures Figure 6-1 through Figure 6-7. For the non-acute risk figures, the nearest exposure locations are also shown.

Figure 6-1. Risk Contour Map – Residential Chronic Cancer

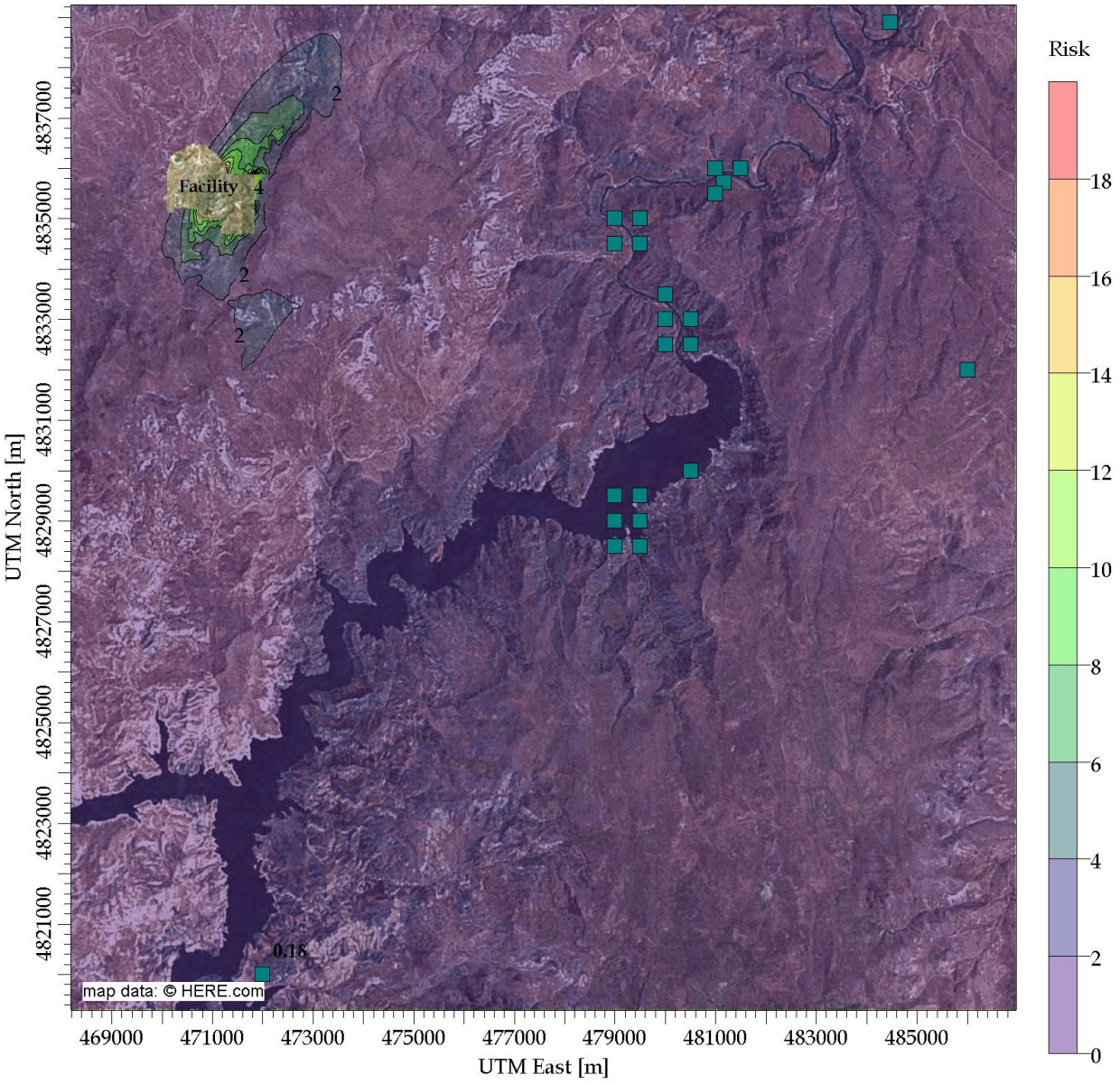


Figure 6-2. Risk Contour Map – Child Chronic Cancer

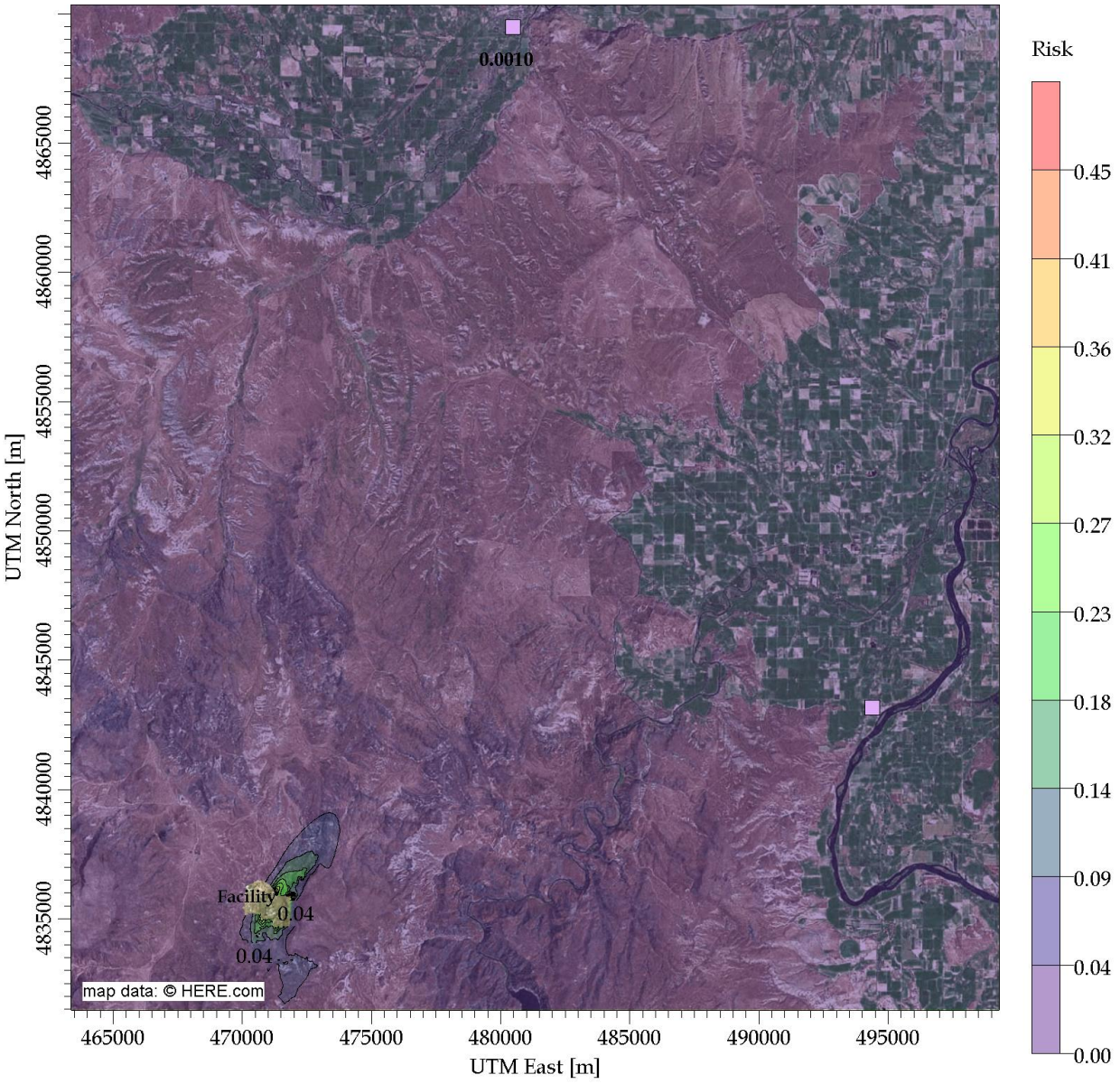


Figure 6-3. Risk Contour Map – Worker Chronic Cancer

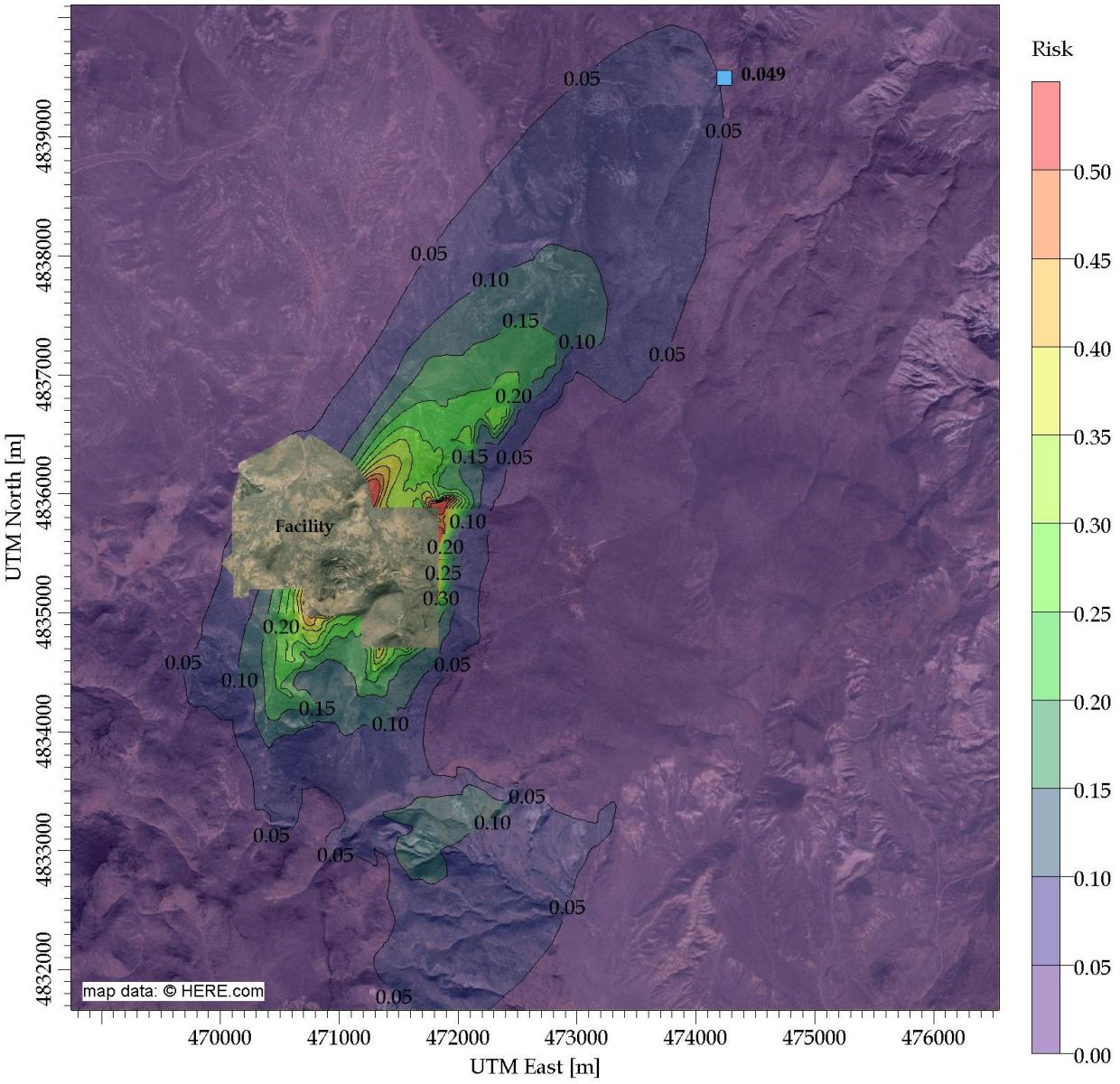


Figure 6-4. Risk Contour Map – Residential Chronic Noncancer

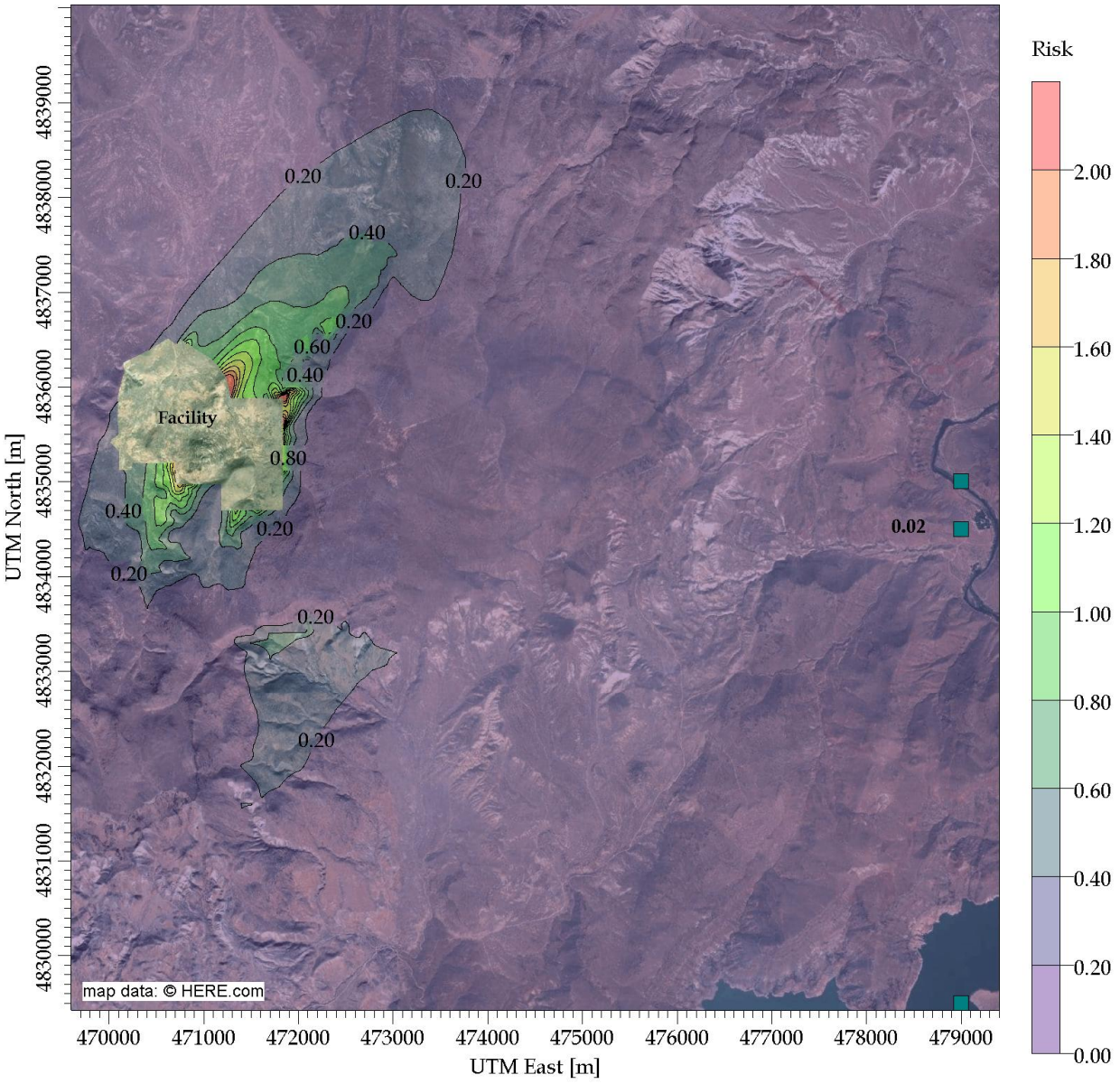


Figure 6-5. Risk Contour Map – Child Chronic Noncancer

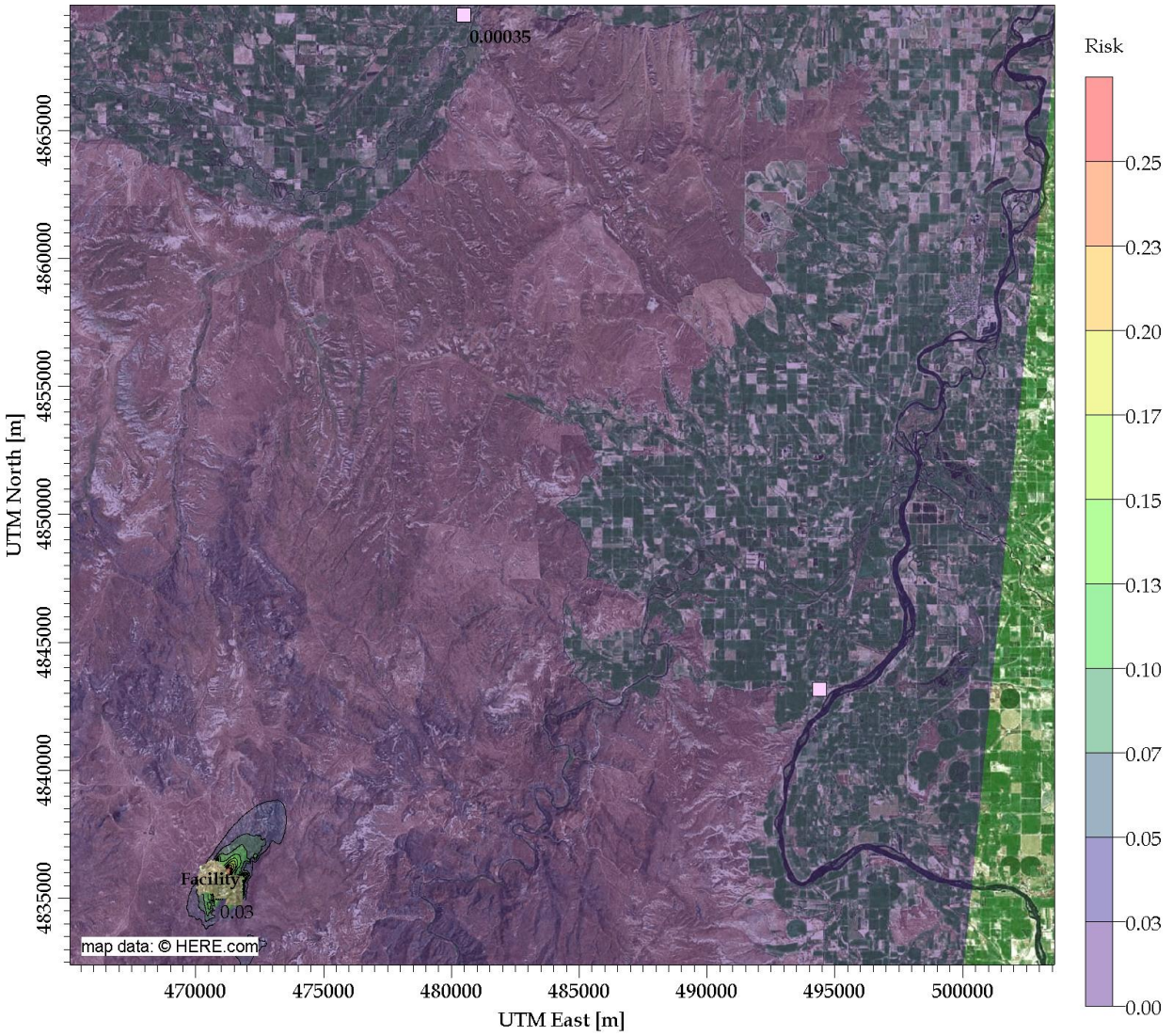


Figure 6-6. Risk Contour Map – Worker Chronic Noncancer

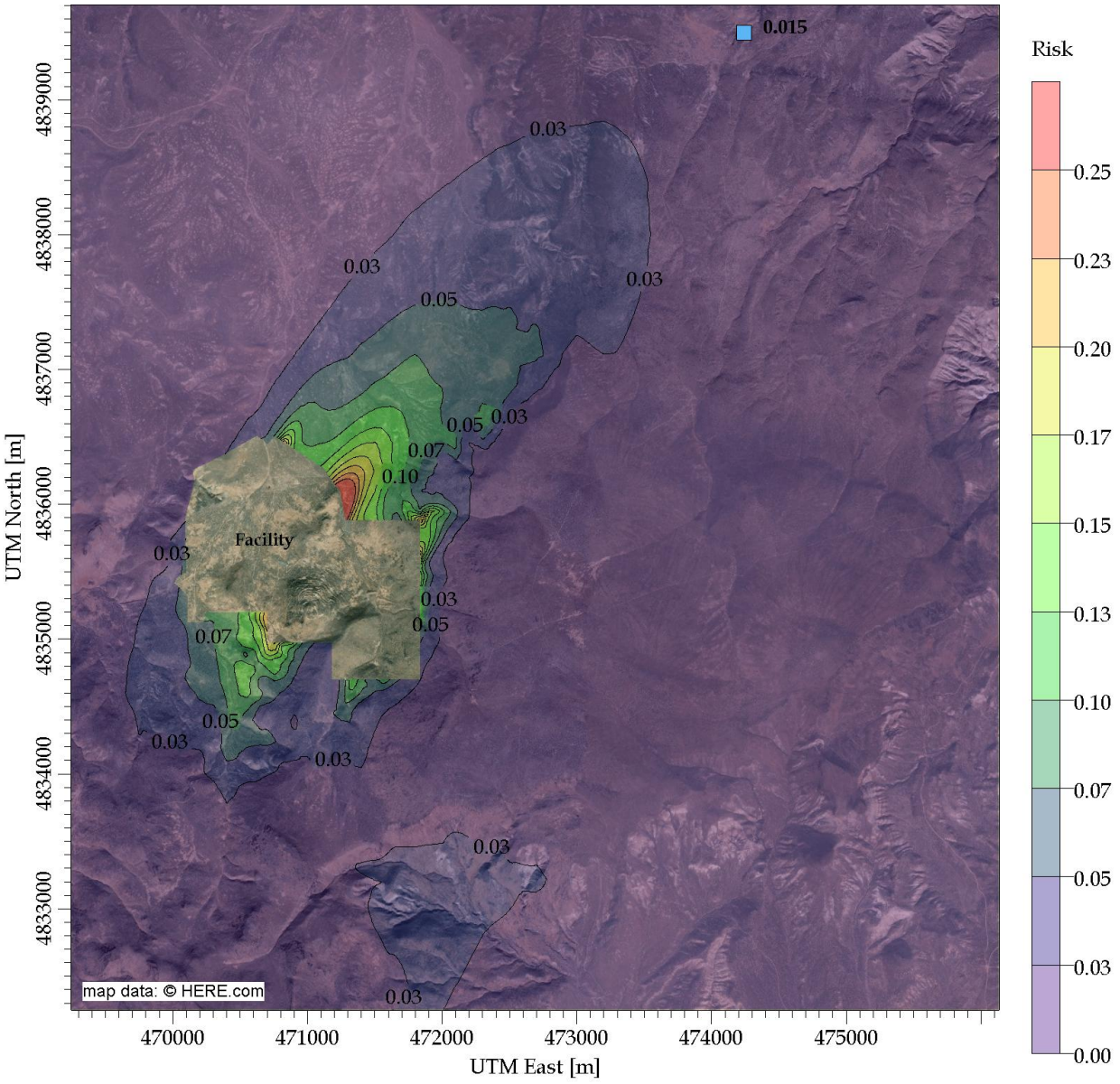
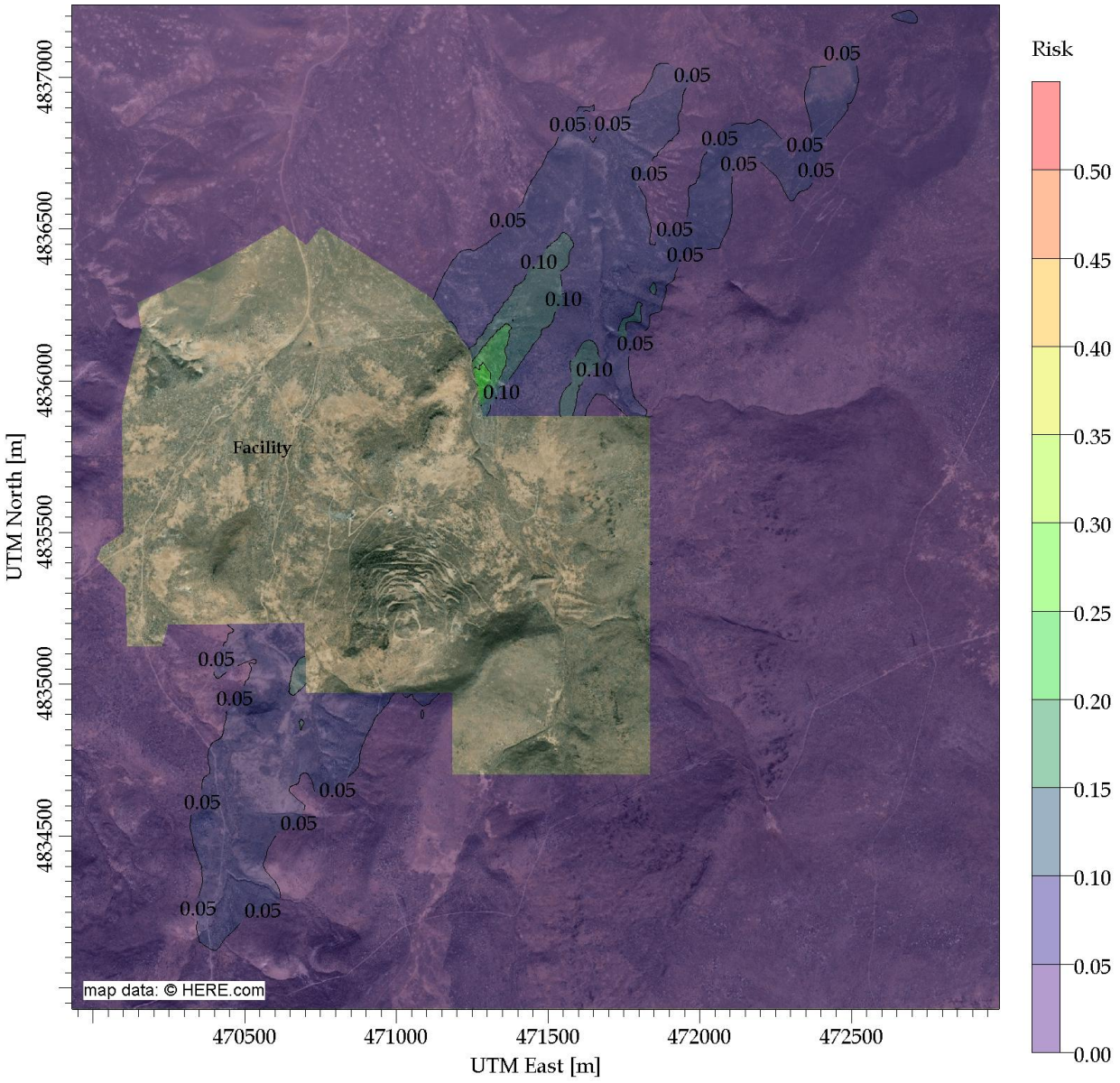


Figure 6-7. Risk Contour Map – Acute Noncancer



6.1 Uncertainty Evaluation

While all guidance and best practices were followed, several factors contribute to uncertainty in the final risk estimates. Those factors include the following:

- If Risk-Based Concentrations (RBCs) are developed using Toxicity Reference Values (TRVs) derived from exposures of less than 24 hours (e.g., eight hours or one hour), using a 24-hour averaging period may underestimate risk.
- Uncertainty in the RBCs leads to corresponding uncertainty in the estimation of risk from those TACs.
- For the assessment, 16 TACs identified by Oregon DEQ, included in the emissions inventory, and listed in Table 5-1 have no RBC, and therefore any potential risk associated with exposure to them was not quantified.
- Pollutant emissions have been estimated with widely used, generally accepted emission factors that are appropriate for each emission source. However, in some cases, the best (or only) available emission factor is rated "C" (average), "D" (below average) or "E" (poor). These low emission factor quality ratings lead to higher uncertainty in the emission estimates as well as the risk estimates based on those emissions. In particular, the calculations of PM emissions (a primary source of TACs) use conservatively high emission factors. This leads to a correspondingly high over-estimation of risk in the assessment.
- Acute risk estimates are based on 24-hour emission rates. The 24-hour process emission rates are calculated from maximum hourly activity occurring all hours of day. This continuous level of activity is unlikely to occur for all emission sources at the same time. For example, during blasting a large area of the facility must be cleared, and all other activity in the vicinity stops. A day on which multiple blast events occur would likely have reduced emissions from other mining activity. However, calculated maximum emission rates do not take this into account, which leads to an overestimation of risk in the assessment.
- The acute risk estimate is based on a 24-hour exposure period at a single location. For many of the locations assessed for acute exposure and near to the facility, a continuous 24-hour exposure is unlikely due to the remote nature of the facility.
- The risk assessment is based on AERMOD modeling. The AERMOD modeling system has been demonstrated to generally over-predict the highest modeled impacts, which leads to a corresponding overestimation of risk. [11]

[11] See, e.g., EPA. 2018. Environmental Protection Agency, "AERMOD Model Formulation and Evaluation." EPA-454/R-18-2003. April, 2018.

Appendix A – Model Source Parameters

Table A-1. AERMOD POINT Source Parameters

Model ID	Description	UTM E. (m)	UTM N. (m)	Elev. (m)	Rel. Ht. (m)	T (K)	Vel. (m/s)	Dia. (m)
LS1	Lime Silo Loading	471029.00	4835733.09	1132.86	3.72	0.00	30.48	0.15
CKD	Carbon Regeneration Kiln (Drum)	471058.00	4835716.22	1132.86	6.10	338.7	3.09	0.15
CKB	Carbon Regeneration Kiln (Burners)	471060.00	4835716.15	1132.86	6.10	455.4	0.00	0.15
EW	Electrowinning Cells & Pregnant Solution Tank	471061.00	4835708.50	1132.71	6.10	310.9	49.19	0.20
MR	Mercury Retort	471067.00	4835705.70	1132.71	6.10	338.7	1.54	0.09
MF	Melting Furnace	471070.00	4835705.25	1132.71	6.10	338.7	30.40	0.30
LABSP	Sample Preparation	471102.79	4835694.81	1129.42	2.32	0.00	4.15	0.76
LABFA	Fire Assay	471102.79	4835694.81	1129.42	2.32	0.00	4.15	0.76
EDG1	Emergency Generator (Mfr. Yr. >2007; diesel)	471067.88	4835743.52	1132.15	3.05	727.59	28.82	0.20
EDFP	Emergency Diesel Fire Pump	471073.88	4835743.52	1132.21	4.57	866.48	30.05	0.20
HA	Administration HVAC	471107.49	4835718.64	1129.42	2.32	455.4	0.17	1.13
HPO	Plant Office and Dry HVAC	471112.49	4835718.64	1129.42	2.32	455.4	0.17	1.13
HL	Laboratory HVAC	471104.79	4835694.81	1129.42	2.32	455.4	0.17	1.13
HWW	Plant Workshop and Warehouse HVAC	471126.42	4835693.95	1129.42	2.32	455.4	0.17	1.13
HTW	Truck Workshop and Warehouse HVAC	471085.16	4835636.39	1138.32	4.74	455.4	0.34	1.13
HMO	Mine Office and Changehouse HVAC	471117.49	4835718.64	1129.42	2.32	455.4	0.17	1.13
CEM1	Cement/Shotcrete loading to silo	470914.33	4835478.67	1141.73	4.09	0.00	30.48	0.15
UG	Underground	471034.00	4835236.00	1209.00	3.00	298.2	20.98	3.66

Table A-2. AERMOD VOLUME Source Parameters

Model ID	Description	UTM E. (m)	UTM N. (m)	Elev. (m)	Rel. Ht. (m)	$\sigma_{y,0}$ (m)	$\sigma_{z,0}$ (m)
OC1	Dump of ore to run-of-mine (ROM) hopper	470989.00	4835653.60	1137.03	6.11	0.40	2.51
OC2	Hopper to vibrating pan feeder	470989.00	4835655.60	1137.03	3.75	0.13	0.28
OC3	Primary crusher (including transfers in and out)	470989.00	4835657.60	1137.03	2.67	0.17	0.50
OC4	Primary crusher discharge conveyor transfer to screen feed conveyor	470989.00	4835659.60	1137.03	2.62	0.17	0.23
OC5	Ore screen (including transfers in and out)	470986.00	4835673.00	1137.03	3.15	0.21	0.92
OC6	Transfer to secondary crusher surge bin	470983.00	4835657.60	1137.03	0.91	0.11	0.28
OC7	Secondary crusher surge bin to secondary crusher vibrating feeder	470983.00	4835658.60	1137.03	3.78	0.11	0.23
OC8	Secondary crusher (including transfers in and out)	470986.00	4835682.06	1137.03	3.67	0.14	0.44
OC9	Secondary crusher discharge conveyor transfer to screen feed conveyor	470989.00	4835660.10	1137.03	2.07	0.17	0.37
OC10	Screen discharge conveyor transfer to product conveyor	470991.00	4835660.10	1137.03	7.50	0.17	1.25
OC11	Product conveyor transfer to fine ore bin	471057.00	4835682.06	1137.03	5.12	0.57	1.62
OC12	Fine ore bin discharge feeder to ball mill feed conveyor	471057.00	4835684.06	1137.03	2.76	0.14	1.03
OC13	Ball mill feed conveyor to ball mill transfer	471057.00	4835724.00	1133.00	6.87	0.24	1.09
BC1	Dump of borrow to surge bin	471677.83	4835421.21	1162.61	6.11	0.40	2.51
BC2	Surge bin to vibrating grizzly transfer	471677.83	4835425.21	1161.78	3.75	0.13	0.28
BC3	Primary crusher (including transfers in and out)	471677.83	4835427.60	1161.28	2.67	0.17	0.50
BC4	Crusher discharge conveyor transfer point	471677.83	4835430.12	1160.76	2.62	0.17	0.23
BC5	Screen feed conveyor 1 transfer point	471677.83	4835430.12	1160.76	0.91	0.11	0.28
BC6	Screen feed conveyor 2 transfer point	471677.83	4835430.12	1160.76	3.78	0.11	0.23
BC7	Screen (including transfers in and out)	471677.83	4835430.12	1160.76	3.15	0.21	0.92
BC8	Cone crusher (including transfers in and out)	471677.83	4835427.60	1161.28	3.67	0.14	0.44
BC9	Screen discharge conveyor transfer to stockpile conveyor	471667.63	4835430.12	1160.04	2.07	0.17	0.37
BC10	Ore stockpile conveyor transfer to borrow stockpile	471680.12	4835465.77	1160.95	7.50	0.17	1.25
LS2	Lime silo unloading to lime slaker	471023.00	4835717.69	1132.86	1.14	0.17	1.06
CEM2	Cement/Shotcrete unloading to batch plant	470918.73	4835517.90	1141.73	1.14	0.17	1.06
CEM3	Aggregate transfer	470918.73	4835517.90	1141.73	1.86	0.59	1.73
CEM4	Weigh hopper loading	470918.73	4835517.90	1141.73	1.86	0.59	1.73
CEM5	Mixer loading (central mix)	470918.73	4835517.90	1141.73	1.86	0.59	1.73
TG1	Mine site gasoline tank #1	471041.97	4835607.09	1138.32	1.45	0.67	1.35
TD1	Mine site diesel tank #1	471041.97	4835607.09	1138.32	2.74	1.28	2.55
TD2	Mine site diesel tank #2	471041.97	4835607.09	1138.32	1.07	0.50	0.99

Model ID	Description	UTM E. (m)	UTM N. (m)	Elev. (m)	Rel. Ht. (m)	$\sigma_{y,0}$ (m)	$\sigma_{z,0}$ (m)
BRWBLAST	Borrow blasting	471724.00	4835149.00	1185.27	75.00	20.93	34.88
WRSF	Waste Rock Storage Facility	470616.00	4835523.00	1113.73	2.25	27.47	2.10
CRF	Cemented rockfill stockpile	470903.00	4835531.00	1140.34	2.25	4.91	2.10
STK	Ore stockpile	470988.00	4835617.50	1137.03	2.25	7.76	2.10

Table A-3. AERMOD AREA Source Parameters

Model ID	Description	UTM E. (m)	UTM N. (m)	Elev. (m)	Rel. Ht. (m)	X_0 (m)	Y_0 (m)	Angle (deg)	$\sigma_{z,0}$ (m)
BRW	Borrow pit	471619.80	4834732.10	1185.27	2.25	208.30	833.30	-	2.10
TS1	Topsoil storage 1	470380.33	4836335.90	1108.38	-	150.20	300.50	58.40	-
TS2	Topsoil storage 2	470138.30	4835246.80	1083.58	-	144.10	144.10	-	-
TSF	Tailings storage facility	470108.95	4835830.68	1103.38	-	418.46	836.93	59.53	-
POND	Tailings pipeline reclaim pond	470719.50	4836288.40	1076.06	-	38.60	38.60	-	-
LEACH1	CN leach tank 1	471022.12	4835705.18	1133.79	7.80	5.76	5.76	-	-
LEACH2	CN leach tank 2	471030.12	4835705.18	1133.79	7.80	5.76	5.76	-	-
CILTANK1	CIL tank 1	471037.12	4835705.18	1133.79	7.80	5.76	5.76	-	-
CILTANK2	CIL tank 2	471045.12	4835705.18	1133.79	7.80	5.76	5.76	-	-
CILTANK3	CIL tank 3	471049.12	4835698.20	1133.79	7.80	5.76	5.76	-	-
CILTANK4	CIL tank 4	471041.12	4835698.20	1133.79	7.80	5.76	5.76	-	-
CILTANK5	CIL tank 5	471033.12	4835698.21	1133.79	7.80	5.76	5.76	-	-
CILTANK6	CIL tank 6	471026.12	4835698.20	1133.79	7.80	5.76	5.76	-	-
CILTANK7	CIL tank 7	471018.12	4835698.21	1133.79	7.80	5.76	5.76	-	-

Table A-4. AERMOD LINE Source Locations

Route	Model ID	X1	Y1	X2	Y2	Elev. (m)
Portal Cut to WRSF	HR_POR_WRF1	470,899.15	4,835,456.84	470,882.68	4,835,484.36	1,145.72
	HR_POR_WRF2	470,882.68	4,835,484.36	470,868.72	4,835,507.67	1,139.93
	HR_POR_WRF3	470,868.72	4,835,507.67	470,793.34	4,835,633.62	1,127.30
	HR_POR_WRF4	470,793.34	4,835,633.62	470,732.85	4,835,631.70	1,114.15
	HR_POR_WRF5	470,732.85	4,835,631.70	470,677.88	4,835,563.65	1,110.32
Portal Cut to Ore Stockpile	HR_POR_ORE1	470,899.15	4,835,456.84	470,882.68	4,835,484.36	1,145.72
	HR_POR_ORE2	470,882.68	4,835,484.36	470,868.72	4,835,507.67	1,139.93
	HR_POR_ORE3	470,868.72	4,835,507.67	470,939.99	4,835,614.43	1,137.82
South Entrance Borrow to WRSF	HR_BWS_WRF1	471,613.97	4,834,902.04	471,584.03	4,834,992.14	1,172.41
	HR_BWS_WRF2	471,584.03	4,834,992.14	471,562.21	4,835,182.20	1,158.90
	HR_BWS_WRF3	471,562.21	4,835,182.20	471,550.93	4,835,351.66	1,149.58
	HR_BWS_WRF4	471,550.93	4,835,351.66	471,451.28	4,835,552.61	1,140.36
	HR_BWS_WRF5	471,451.28	4,835,552.61	471,233.88	4,835,601.96	1,133.31
	HR_BWS_WRF6	471,233.88	4,835,601.96	470,898.18	4,835,551.79	1,135.69
	HR_BWS_WRF7	470,898.18	4,835,551.79	470,868.72	4,835,507.67	1,137.56
	HR_BWS_WRF8	470,868.72	4,835,507.67	470,793.34	4,835,633.62	1,127.30
	HR_BWS_WRF9	470,793.34	4,835,633.62	470,732.85	4,835,631.70	1,114.15
	HR_BWS_WRF10	470,732.85	4,835,631.70	470,677.88	4,835,563.65	1,110.32
North Entrance Borrow to WRSF	HR_BWN_WRF1	471,677.83	4,835,421.21	471,630.99	4,835,410.94	1,160.96
	HR_BWN_WRF2	471,630.99	4,835,410.94	471,562.21	4,835,182.20	1,155.40
	HR_BWN_WRF3	471,562.21	4,835,182.20	471,550.93	4,835,351.66	1,149.58
	HR_BWN_WRF4	471,550.93	4,835,351.66	471,451.28	4,835,552.61	1,140.36
	HR_BWN_WRF5	471,451.28	4,835,552.61	471,233.88	4,835,601.96	1,133.31
	HR_BWN_WRF6	471,233.88	4,835,601.96	470,898.18	4,835,551.79	1,135.69
	HR_BWN_WRF7	470,898.18	4,835,551.79	470,868.72	4,835,507.67	1,137.56
	HR_BWN_WRF8	470,868.72	4,835,507.67	470,793.34	4,835,633.62	1,127.30
	HR_BWN_WRF9	470,793.34	4,835,633.62	470,732.85	4,835,631.70	1,114.15
	HR_BWN_WRF10	470,732.85	4,835,631.70	470,677.88	4,835,563.65	1,110.32
WRSF to Portal Cut	HR_WRF_POR1	470,677.88	4,835,563.65	470,732.85	4,835,631.70	1,110.32
	HR_WRF_POR2	470,732.85	4,835,631.70	470,793.34	4,835,633.62	1,114.15
	HR_WRF_POR3	470,793.34	4,835,633.62	470,868.72	4,835,507.67	1,127.30
	HR_WRF_POR4	470,868.72	4,835,507.67	470,882.68	4,835,484.36	1,139.93
	HR_WRF_POR5	470,882.68	4,835,484.36	470,899.15	4,835,456.84	1,145.72
WRSF to CRF Stockpile	HR_WRF_CRF1	470,677.88	4,835,563.65	470,732.85	4,835,631.70	1,110.32
	HR_WRF_CRF2	470,732.85	4,835,631.70	470,793.34	4,835,633.62	1,114.15
	HR_WRF_CRF3	470,793.34	4,835,633.62	470,868.72	4,835,507.67	1,127.30
	HR_WRF_CRF4	470,868.72	4,835,507.67	470,882.68	4,835,484.36	1,139.93
	HR_WRF_CRF5	470,882.68	4,835,484.36	470,894.69	4,835,516.89	1,141.56
CRF Stockpile to Portal Cut	HR_CRF_POR1	470,894.69	4,835,516.89	470,882.68	4,835,484.36	1,141.56
	HR_CRF_POR2	470,882.68	4,835,484.36	470,899.15	4,835,456.84	1,145.72

Table A-5. AERMOD LINE Source Parameters[a]

Model ID	Rel. Ht. (m)	Width (m)	$\sigma_{z,0}$ (m)
HR_*	2.27	9.88	2.11

[a] All haul road LINE sources are characterized with identical release heights, widths, and initial vertical dispersion based on the mobile machinery parameters.

Appendix B - BPIPPRM Building Parameters

Buildings dimensions were based on the planned facility layout. The formatted BPIP-Prime text file that includes building information is included in the digital attachment link below.

The attachment contains all files needed to run AERMOD 22112, in addition to Microsoft Excel worksheets detailing all emissions inventory calculations.

https://ftps.airsci.com/?ShareToken=D96DC9BF9A4E8D0C31AED462D319ABEA495AA1CA

Appendix C – TAC Emission Rates

Table C-1. TAC Emissions by TEU for Chronic Exposure

CAS	Chemical Name	OC	BC	UB	BRWB	UBD	BRWBD	HA	HPO
7440-36-0	Antimony and compounds	7.41E-2	6.81E-1						
7440-38-2	Arsenic and compounds	2.76E-1	2.00E+0			4.93E-3	6.37E-4	1.72E-3	1.72E-3
7440-41-7	Beryllium and compounds	1.95E-3	2.57E-2			3.70E-3	4.77E-4	1.03E-4	1.03E-4
7440-43-9	Cadmium and compounds	3.57E-4	2.95E-3			3.70E-3	4.77E-4	9.45E-3	9.45E-3
18540-29-9	Chromium VI, chromate, and dichromate particulate	4.98E-2	3.24E-1			3.70E-3	4.77E-4	1.20E-2	1.20E-2
7440-48-4	Cobalt and compounds	2.54E-3	3.90E-2					7.21E-4	7.21E-4
7439-92-1	Lead and compounds	1.15E-2	1.17E-1			1.11E-2	1.43E-3		
7439-96-5	Manganese and compounds	1.36E-1	1.37E+0			7.40E-3	9.55E-4	3.26E-3	3.26E-3
7439-97-6	Mercury and compounds	4.00E-3	3.41E-2			3.70E-3	4.77E-4	2.23E-3	2.23E-3
C365	Nickel compounds, insoluble	8.26E-3	6.33E-2			3.70E-3	4.77E-4	1.80E-2	1.80E-2
7440-39-3	Barium and compounds	1.18E+0	1.03E+1					3.78E-2	3.78E-2
7440-50-8	Copper and compounds	3.18E-2	1.39E-1			7.40E-3	9.55E-4	7.30E-3	7.30E-3
7440-62-2	Vanadium (fume or dust)	2.87E-2	2.86E-1					1.98E-2	1.98E-2
7440-66-6	Zinc and compounds	2.94E-2	2.61E-1			4.93E-3	6.37E-4	2.49E-1	2.49E-1
1313-27-5	Molybdenum trioxide	1.57E-2	9.39E-2						
7440-22-4	Silver and compounds	1.67E-2	2.62E-2						
7631-86-9	Silica, crystalline (respirable)	4.32E+2	3.33E+3						
115-07-1	Propylene			1.48E+1	1.91E+0			2.02E+0	2.02E+0
106-99-0	1,3-Butadiene			8.04E-1	1.04E-1				
75-05-8	Acetonitrile			1.06E+1	1.37E+0				
107-02-8	Acrolein			1.06E+0	1.37E-1			4.16E-2	4.16E-2
67-64-1	Acetone			7.19E-1	9.28E-2				
67-63-0	Isopropyl alcohol			1.38E+0	1.77E-1				
107-13-1	Acrylonitrile			2.01E+0	2.59E-1				
71-43-2	Benzene			1.27E+1	1.64E+0			9.59E-2	9.59E-2
108-88-3	Toluene			1.90E+0	2.46E-1			3.14E-1	3.14E-1
100-41-4	Ethyl benzene			1.27E-1	1.64E-2			8.16E-2	8.16E-2
100-42-5	Styrene			9.52E-1	1.23E-1				
108-67-8	1,3,5-Trimethylbenzene			2.96E-1	3.82E-2				
91-20-3	Naphthalene			2.01E+0	2.59E-1			9.58E-3	9.58E-3
7782-49-2	Selenium and compounds					1.85E-2	2.39E-3	2.06E-4	2.06E-4
91-57-6	2-Methyl naphthalene							2.06E-4	2.06E-4
56-49-5	3-Methylcholanthrene							1.55E-5	1.55E-5
57-97-6	7,12-Dimethylbenz[a]anthracene							1.37E-4	1.37E-4
83-32-9	Acenaphthene							1.19E-5	1.19E-5
208-96-8	Acenaphthylene							1.04E-4	1.04E-4

CAS	Chemical Name	OC	BC	UB	BRWB	UBD	BRWBD	HA	HPO
75-07-0	Acetaldehyde							1.20E-1	1.20E-1
7664-41-7	Ammonia							1.55E+2	1.55E+2
120-12-7	Anthracene							1.38E-5	1.38E-5
56-55-3	Benz[a]anthracene							1.68E-5	1.68E-5
50-32-8	Benzo[a]pyrene							8.42E-6	8.42E-6
205-99-2	Benzo[b]fluoranthene							9.79E-6	9.79E-6
191-24-2	Benzo[g,h,i]perylene							1.07E-5	1.07E-5
207-08-9	Benzo[k]fluoranthene							8.50E-6	8.50E-6
218-01-9	Chrysene							1.19E-5	1.19E-5
53-70-3	Dibenz[a,h]anthracene							7.88E-6	7.88E-6
206-44-0	Fluoranthene							1.02E-4	1.02E-4
86-73-7	Fluorene							3.94E-5	3.94E-5
50-00-0	Formaldehyde							6.36E-1	6.36E-1
110-54-3	Hexane							1.55E+1	1.55E+1
193-39-5	Indeno[1,2,3-cd]pyrene							1.00E-5	1.00E-5
106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)							1.03E-2	1.03E-2
85-01-8	Phenanthrene							2.89E-4	2.89E-4
129-00-0	Pyrene							4.81E-5	4.81E-5
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene							2.34E-1	2.34E-1

Table C-1. TAC Emissions by TEU for Chronic Exposure (cont.)

CAS	Chemical Name	HL	HWW	HTW	HMO	CKD	EW	MR	MFP
7440-36-0	Antimony and compounds					2.18E-2			2.12E-2
7440-38-2	Arsenic and compounds	1.72E-3	1.72E-3	3.44E-3	1.72E-3	8.11E-2			7.88E-2
7440-41-7	Beryllium and compounds	1.03E-4	1.03E-4	2.06E-4	1.03E-4	5.73E-4			5.57E-4
7440-43-9	Cadmium and compounds	9.45E-3	9.45E-3	1.89E-2	9.45E-3	1.05E-4			1.02E-4
18540-29-9	Chromium VI, chromate, and dichromate particulate	1.20E-2	1.20E-2	2.40E-2	1.20E-2	1.46E-2			1.42E-2
7440-48-4	Cobalt and compounds	7.21E-4	7.21E-4	1.44E-3	7.21E-4	7.46E-4			7.26E-4
7439-92-1	Lead and compounds					3.39E-3			3.30E-3
7439-96-5	Manganese and compounds	3.26E-3	3.26E-3	6.53E-3	3.26E-3	3.99E-2			3.88E-2
7439-97-6	Mercury and compounds	2.23E-3	2.23E-3	4.47E-3	2.23E-3	2.08E+0	5.05E+0	2.35E-1	
C365	Nickel compounds, insoluble	1.80E-2	1.80E-2	3.61E-2	1.80E-2	2.43E-3			2.36E-3
7440-39-3	Barium and compounds	3.78E-2	3.78E-2	7.56E-2	3.78E-2	3.48E-1			3.38E-1
7440-50-8	Copper and compounds	7.30E-3	7.30E-3	1.46E-2	7.30E-3	9.36E-3			9.11E-3
7440-62-2	Vanadium (fume or dust)	1.98E-2	1.98E-2	3.95E-2	1.98E-2	8.44E-3			8.21E-3
7440-66-6	Zinc and compounds	2.49E-1	2.49E-1	4.98E-1	2.49E-1	8.64E-3			8.41E-3
1313-27-5	Molybdenum trioxide					4.62E-3			4.49E-3
7440-22-4	Silver and compounds					4.91E-3			4.78E-3
7631-86-9	Silica, crystalline (respirable)					3.34E+2			3.25E+2
115-07-1	Propylene	2.02E+0	2.02E+0	4.03E+0	2.02E+0				
107-02-8	Acrolein	4.16E-2	4.16E-2	8.31E-2	4.16E-2				
71-43-2	Benzene	9.59E-2	9.59E-2	1.92E-1	9.59E-2				
108-88-3	Toluene	3.14E-1	3.14E-1	6.29E-1	3.14E-1				
100-41-4	Ethyl benzene	8.16E-2	8.16E-2	1.63E-1	8.16E-2				
91-20-3	Naphthalene	9.58E-3	9.58E-3	1.92E-2	9.58E-3				
7782-49-2	Selenium and compounds	2.06E-4	2.06E-4	4.12E-4	2.06E-4				
91-57-6	2-Methyl naphthalene	2.06E-4	2.06E-4	4.12E-4	2.06E-4				
56-49-5	3-Methylcholanthrene	1.55E-5	1.55E-5	3.09E-5	1.55E-5				
57-97-6	7,12-Dimethylbenz[a]anthracene	1.37E-4	1.37E-4	2.75E-4	1.37E-4				
83-32-9	Acenaphthene	1.19E-5	1.19E-5	2.39E-5	1.19E-5				
208-96-8	Acenaphthylene	1.04E-4	1.04E-4	2.08E-4	1.04E-4				
75-07-0	Acetaldehyde	1.20E-1	1.20E-1	2.40E-1	1.20E-1				
7664-41-7	Ammonia	1.55E+2	1.55E+2	3.09E+2	1.55E+2				
120-12-7	Anthracene	1.38E-5	1.38E-5	2.77E-5	1.38E-5				
56-55-3	Benz[a]anthracene	1.68E-5	1.68E-5	3.37E-5	1.68E-5				
50-32-8	Benzo[a]pyrene	8.42E-6	8.42E-6	1.68E-5	8.42E-6				
205-99-2	Benzo[b]fluoranthene	9.79E-6	9.79E-6	1.96E-5	9.79E-6				
191-24-2	Benzo[g,h,i]perylene	1.07E-5	1.07E-5	2.15E-5	1.07E-5				
207-08-9	Benzo[k]fluoranthene	8.50E-6	8.50E-6	1.70E-5	8.50E-6				
218-01-9	Chrysene	1.19E-5	1.19E-5	2.39E-5	1.19E-5				
53-70-3	Dibenz[a,h]anthracene	7.88E-6	7.88E-6	1.58E-5	7.88E-6				
206-44-0	Fluoranthene	1.02E-4	1.02E-4	2.04E-4	1.02E-4				

CAS	Chemical Name	HL	HWW	HTW	HMO	CKD	EW	MR	MFP
86-73-7	Fluorene	3.94E-5	3.94E-5	7.88E-5	3.94E-5				
50-00-0	Formaldehyde	6.36E-1	6.36E-1	1.27E+0	6.36E-1				
110-54-3	Hexane	1.55E+1	1.55E+1	3.09E+1	1.55E+1				
193-39-5	Indeno[1,2,3-cd]pyrene	1.00E-5	1.00E-5	2.01E-5	1.00E-5				
106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)	1.03E-2	1.03E-2	2.06E-2	1.03E-2				
85-01-8	Phenanthrene	2.89E-4	2.89E-4	5.79E-4	2.89E-4				
129-00-0	Pyrene	4.81E-5	4.81E-5	9.62E-5	4.81E-5				
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.34E-1	2.34E-1	4.67E-1	2.34E-1				
74-90-8	Cyanide, Hydrogen						4.00E+1		

Table C-1. TAC Emissions by TEU for Chronic Exposure (cont.)

CAS	Chemical Name	MFHG	UFD	AFD	TSF	POND	LEACH1	LEACH2	CILTANK1
7440-36-0	Antimony and compounds		1.27E-2	1.44E-1					
7440-38-2	Arsenic and compounds		4.59E-2	4.42E-1					
7440-41-7	Beryllium and compounds		3.50E-4	5.12E-3					
7440-43-9	Cadmium and compounds		6.03E-5	6.34E-4					
18540-29-9	Chromium VI, chromate, and dichromate particulate		8.22E-3	7.33E-2					
7440-48-4	Cobalt and compounds		4.68E-4	7.64E-3					
7439-92-1	Lead and compounds		1.99E-3	2.42E-2					
7439-96-5	Manganese and compounds		2.34E-2	2.84E-1					
7439-97-6	Mercury and compounds	1.04E+0	6.78E-4	7.29E-3					
C365	Nickel compounds, insoluble		1.38E-3	1.38E-2					
7440-39-3	Barium and compounds		2.01E-1	2.20E+0					
7440-50-8	Copper and compounds		5.10E-3	3.50E-2					
7440-62-2	Vanadium (fume or dust)		4.95E-3	5.95E-2					
7440-66-6	Zinc and compounds		5.00E-3	5.54E-2					
1313-27-5	Molybdenum trioxide		2.57E-3	2.17E-2					
7440-22-4	Silver and compounds		2.57E-3	1.03E-2					
7631-86-9	Silica, crystalline (respirable)		9.59E+1	9.90E+2					
74-90-8	Cyanide, Hydrogen				1.26E+3	2.58E+2	4.19E+2	4.19E+2	2.09E+2

Table C-1. TAC Emissions by TEU for Chronic Exposure (cont.)

CAS	Chemical Name	CILTANK2	CILTANK3	CILTANK4	CILTANK5	CILTANK6	CILTANK7	CEM1	CEM2
7440-38-2	Arsenic and compounds							2.67E-3	2.67E-3
7440-41-7	Beryllium and compounds							2.43E-4	2.43E-4
7440-43-9	Cadmium and compounds							7.61E-5	7.61E-5
18540-29-9	Chromium VI, chromate, and dichromate particulate							3.64E-3	3.64E-3
7439-92-1	Lead and compounds							1.53E-3	1.53E-3
7439-96-5	Manganese and compounds							2.55E-3	2.55E-3
C365	Nickel compounds, insoluble							6.60E-3	6.60E-3
7631-86-9	Silica, crystalline (respirable)							1.27E-1	1.27E-1
7782-49-2	Selenium and compounds							1.88E-4	1.88E-4
74-90-8	Cyanide, Hydrogen	2.09E+2	2.09E+2	2.09E+2	2.09E+2	2.09E+2	2.09E+2		
12185-10-3	Phosphorus, white							1.30E-2	1.30E-2

Table C-1. TAC Emissions by TEU for Chronic Exposure (cont.)

CAS	Chemical Name	CEM3	CEM4	CEM5	UDP	EDG1	MFD	EDFP	LS1
7440-36-0	Antimony and compounds	8.34E-2	5.80E-2						
7440-38-2	Arsenic and compounds	2.45E-1	1.70E-1	5.55E-3	2.63E-1	2.19E-2	5.46E-3	2.19E-3	
7440-41-7	Beryllium and compounds	3.14E-3	2.19E-3						
7440-43-9	Cadmium and compounds	3.61E-4	2.51E-4	1.33E-5	2.46E-1	2.06E-2	5.12E-3	2.06E-3	
18540-29-9	Chromium VI, chromate, and dichromate particulate	3.96E-2	2.76E-2	2.38E-3	1.64E-2	1.37E-3	3.42E-4	1.37E-4	
7440-48-4	Cobalt and compounds	4.78E-3	3.32E-3						
7439-92-1	Lead and compounds	1.43E-2	9.94E-3	6.86E-4	1.36E+0	1.14E-1	2.83E-2	1.14E-2	
7439-96-5	Manganese and compounds	1.68E-1	1.17E-1	7.08E-2	5.09E-1	4.25E-2	1.06E-2	4.25E-3	
7439-97-6	Mercury and compounds	4.17E-3	2.90E-3		3.28E-1	2.74E-2	6.83E-3	2.74E-3	
C365	Nickel compounds, insoluble	7.75E-3	5.39E-3	4.65E-3	6.40E-1	5.34E-2	1.33E-2	5.34E-3	
7440-39-3	Barium and compounds	1.27E+0	8.80E-1						
7440-50-8	Copper and compounds	1.70E-2	1.18E-2		6.73E-1	5.62E-2	1.40E-2	5.62E-3	
7440-62-2	Vanadium (fume or dust)	3.50E-2	2.44E-2						
7440-66-6	Zinc and compounds	3.20E-2	2.22E-2		3.68E+0	3.07E-1	7.65E-2	3.07E-2	
1313-27-5	Molybdenum trioxide	1.15E-2	8.00E-3						
7440-22-4	Silver and compounds	3.21E-3	2.24E-3						
7631-86-9	Silica, crystalline (respirable)	5.23E+2	4.43E+2	2.55E-1					1.12E-6
115-07-1	Propylene				7.66E+1	6.40E+0	3.42E-2	6.40E-1	
106-99-0	1,3-Butadiene				3.57E+1	2.98E+0	5.05E-2	2.98E-1	
107-02-8	Acrolein				5.56E+0	4.65E-1	1.20E+0	4.65E-2	
71-43-2	Benzene				3.06E+1	2.55E+0	1.50E-2	2.55E-1	
108-88-3	Toluene				1.73E+1	1.44E+0	1.50E-2	1.44E-1	
100-41-4	Ethyl benzene				1.79E+0	1.49E-1	6.83E-4	1.49E-2	
91-20-3	Naphthalene				3.23E+0	2.70E-1	1.81E-2	2.70E-2	
7782-49-2	Selenium and compounds				3.61E-1	3.01E-2	7.51E-3	3.01E-3	
91-57-6	2-Methyl naphthalene						4.78E-4		
83-32-9	Acenaphthene				5.50E-1	4.59E-2	7.21E-4	4.59E-3	
208-96-8	Acenaphthylene				6.67E-1	5.57E-2	2.22E-4	5.57E-3	
75-07-0	Acetaldehyde				1.29E+2	1.07E+1	1.20E+0	1.07E+0	
7664-41-7	Ammonia				4.76E+2	3.97E+1	9.90E+0	3.97E+0	
120-12-7	Anthracene				6.59E-1	5.50E-2	8.16E-5	5.50E-3	
56-55-3	Benz[a]anthracene				6.41E-1	5.35E-2	4.61E-5	5.35E-3	
50-32-8	Benzo[a]pyrene				5.83E-3	4.86E-4	2.58E-5	4.86E-5	
205-99-2	Benzo[b]fluoranthene				1.10E+0	9.18E-2	2.28E-5	9.18E-3	
191-24-2	Benzo[g,h,i]perylene				4.68E-4	3.91E-5	2.90E-5	3.91E-6	
207-08-9	Benzo[k]fluoranthene				1.10E+0	9.18E-2	2.84E-4	9.18E-3	
218-01-9	Chrysene				5.87E-1	4.90E-2	4.37E-5	4.90E-3	
53-70-3	Dibenz[a,h]anthracene				5.73E-1	4.78E-2	2.22E-5	4.78E-3	
206-44-0	Fluoranthene				6.56E-1	5.48E-2	1.13E-4	5.48E-3	
86-73-7	Fluorene				3.47E+0	2.89E-1	4.00E-4	2.89E-2	

CAS	Chemical Name	CEM3	CEM4	CEM5	UDP	EDG1	MFD	EDFP	LS1
50-00-0	Formaldehyde				2.83E+2	2.37E+1	1.20E+0	2.37E+0	
110-54-3	Hexane				4.42E+0	3.69E-1	1.20E-2	3.69E-2	
193-39-5	Indeno[1,2,3-cd]pyrene				5.68E-1	4.74E-2	2.27E-5	4.74E-3	
85-01-8	Phenanthrene				6.40E+0	5.34E-1	1.27E-3	5.34E-2	
129-00-0	Pyrene				1.38E+0	1.15E-1	1.39E-4	1.15E-2	
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene				6.96E+1	5.81E+0	5.46E-3	5.81E-1	
12185-10-3	Phosphorus, white			3.00E-2					
108-90-7	Chlorobenzene				3.28E-2	2.74E-3	6.83E-4	2.74E-4	
7647-01-0	Hydrochloric Acid				3.06E+1	2.55E+0	6.36E-1	2.55E-1	
C200	Diesel Particulate Matter				5.50E+3	1.69E+3		1.69E+2	
192-97-2	Benzo[e]pyrene						4.78E-5		
198-55-0	Perylene						9.26E-5		

Table C-1. TAC Emissions by TEU for Chronic Exposure (cont.)

CAS	Chemical Name	LS2	TG1	TD1	TD2
7439-97-6	Mercury and compounds			3.27E-6	3.44E-7
7631-86-9	Silica, crystalline (respirable)	9.20E-6			
71-43-2	Benzene		3.33E+1	6.87E-5	7.22E-6
108-88-3	Toluene		1.34E+2	2.62E-3	2.75E-4
100-41-4	Ethyl benzene		2.97E+1	1.06E-3	1.12E-4
100-42-5	Styrene			2.62E-3	2.75E-4
91-20-3	Naphthalene		8.22E+0	4.50E-2	4.73E-3
110-54-3	Hexane		1.32E+2	8.18E-2	8.60E-3
85-01-8	Phenanthrene			1.02E-2	1.08E-3
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		1.33E+2	2.37E-2	2.49E-3
92-52-4	Biphenyl		1.85E-1	8.18E-3	8.60E-4
110-82-7	Cyclohexane		4.45E+0		
108-95-2	Phenol		1.02E+0	5.24E-3	5.50E-4
95-63-6	1,2,4-Trimethylbenzene		4.63E+1	8.18E-2	8.60E-3
98-82-8	Isopropylbenzene (Cumene)		9.26E+0		

Table C-2. TAC Emissions by TEU for Acute Exposure

CAS	Chemical Name	OC	BC	UB	BRWB	UBD	BRWBD	HA	HPO
7440-36-0	Antimony and compounds	2.03E-4	2.62E-3						
7440-38-2	Arsenic and compounds	7.55E-4	7.70E-3			2.37E-5	2.45E-6	4.71E-6	4.71E-6
7440-41-7	Beryllium and compounds	5.34E-6	9.87E-5			1.78E-5	1.84E-6	2.82E-7	2.82E-7
7440-43-9	Cadmium and compounds	9.79E-7	1.13E-5			1.78E-5	1.84E-6	2.59E-5	2.59E-5
18540-29-9	Chromium VI, chromate, and dichromate particulate	1.36E-4	1.24E-3			1.78E-5	1.84E-6	3.29E-5	3.29E-5
7440-48-4	Cobalt and compounds	6.95E-6	1.50E-4					1.98E-6	1.98E-6
7439-92-1	Lead and compounds	3.16E-5	4.49E-4			5.34E-5	5.51E-6		
7439-96-5	Manganese and compounds	3.71E-4	5.27E-3			3.56E-5	3.67E-6	8.94E-6	8.94E-6
7439-97-6	Mercury and compounds	1.10E-5	1.31E-4			1.78E-5	1.84E-6	6.12E-6	6.12E-6
C365	Nickel compounds, insoluble	2.26E-5	2.43E-4			1.78E-5	1.84E-6	4.94E-5	4.94E-5
7440-39-3	Barium and compounds	3.24E-3	3.97E-2					1.04E-4	1.04E-4
7440-50-8	Copper and compounds	8.72E-5	5.33E-4			3.56E-5	3.67E-6	2.00E-5	2.00E-5
7440-62-2	Vanadium (fume or dust)	7.86E-5	1.10E-3					5.41E-5	5.41E-5
7440-66-6	Zinc and compounds	8.05E-5	1.00E-3			2.37E-5	2.45E-6	6.82E-4	6.82E-4
1313-27-5	Molybdenum trioxide	4.30E-5	3.61E-4						
7440-22-4	Silver and compounds	4.57E-5	1.01E-4						
7631-86-9	Silica, crystalline (respirable)	1.18E+0	1.28E+1						
115-07-1	Propylene			7.12E-2	7.35E-3			5.52E-3	5.52E-3
106-99-0	1,3-Butadiene			3.87E-3	3.99E-4				
75-05-8	Acetonitrile			5.09E-2	5.25E-3				
107-02-8	Acrolein			5.09E-3	5.25E-4			1.14E-4	1.14E-4
67-64-1	Acetone			3.46E-3	3.57E-4				
67-63-0	Isopropyl alcohol			6.61E-3	6.83E-4				
107-13-1	Acrylonitrile			9.66E-3	9.98E-4				
71-43-2	Benzene			6.10E-2	6.30E-3			2.63E-4	2.63E-4
108-88-3	Toluene			9.16E-3	9.45E-4			8.61E-4	8.61E-4
100-41-4	Ethyl benzene			6.10E-4	6.30E-5			2.24E-4	2.24E-4
100-42-5	Styrene			4.58E-3	4.73E-4				
108-67-8	1,3,5-Trimethylbenzene			1.42E-3	1.47E-4				
91-20-3	Naphthalene			9.66E-3	9.98E-4			2.62E-5	2.62E-5
7782-49-2	Selenium and compounds					8.90E-5	9.18E-6	5.65E-7	5.65E-7
91-57-6	2-Methyl naphthalene							5.65E-7	5.65E-7
56-49-5	3-Methylcholanthrene							4.24E-8	4.24E-8
57-97-6	7,12-Dimethylbenz[a]anthracene							3.76E-7	3.76E-7
83-32-9	Acenaphthene							3.27E-8	3.27E-8
208-96-8	Acenaphthylene							2.85E-7	2.85E-7
75-07-0	Acetaldehyde							3.29E-4	3.29E-4
7664-41-7	Ammonia							4.24E-1	4.24E-1
120-12-7	Anthracene							3.79E-8	3.79E-8
56-55-3	Benz[a]anthracene							4.61E-8	4.61E-8

CAS	Chemical Name	OC	BC	UB	BRWB	UBD	BRWBD	HA	HPO
50-32-8	Benzo[a]pyrene							2.31E-8	2.31E-8
205-99-2	Benzo[b]fluoranthene							2.68E-8	2.68E-8
191-24-2	Benzo[g,h,i]perylene							2.94E-8	2.94E-8
207-08-9	Benzo[k]fluoranthene							2.33E-8	2.33E-8
218-01-9	Chrysene							3.27E-8	3.27E-8
53-70-3	Dibenz[a,h]anthracene							2.16E-8	2.16E-8
206-44-0	Fluoranthene							2.80E-7	2.80E-7
86-73-7	Fluorene							1.08E-7	1.08E-7
50-00-0	Formaldehyde							1.74E-3	1.74E-3
110-54-3	Hexane							4.24E-2	4.24E-2
193-39-5	Indeno[1,2,3-cd]pyrene							2.75E-8	2.75E-8
106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)							2.82E-5	2.82E-5
85-01-8	Phenanthrene							7.93E-7	7.93E-7
129-00-0	Pyrene							1.32E-7	1.32E-7
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene							6.40E-4	6.40E-4

Table C-2. TAC Emissions by TEU for Acute Exposure (cont.)

CAS	Chemical Name	HL	HWW	HTW	HMO	CKD	EW	MR	MFP
7440-36-0	Antimony and compounds					5.97E-5			4.07E-4
7440-38-2	Arsenic and compounds	4.71E-6	4.71E-6	9.41E-6	4.71E-6	2.22E-4			1.52E-3
7440-41-7	Beryllium and compounds	2.82E-7	2.82E-7	5.65E-7	2.82E-7	1.57E-6			1.07E-5
7440-43-9	Cadmium and compounds	2.59E-5	2.59E-5	5.18E-5	2.59E-5	2.88E-7			1.97E-6
18540-29-9	Chromium VI, chromate, and dichromate particulate	3.29E-5	3.29E-5	6.59E-5	3.29E-5	4.01E-5			2.74E-4
7440-48-4	Cobalt and compounds	1.98E-6	1.98E-6	3.95E-6	1.98E-6	2.04E-6			1.40E-5
7439-92-1	Lead and compounds					9.29E-6			6.34E-5
7439-96-5	Manganese and compounds	8.94E-6	8.94E-6	1.79E-5	8.94E-6	1.09E-4			7.46E-4
7439-97-6	Mercury and compounds	6.12E-6	6.12E-6	1.22E-5	6.12E-6	1.25E-2	3.03E-2	4.70E-3	
C365	Nickel compounds, insoluble	4.94E-5	4.94E-5	9.88E-5	4.94E-5	6.65E-6			4.54E-5
7440-39-3	Barium and compounds	1.04E-4	1.04E-4	2.07E-4	1.04E-4	9.52E-4			6.50E-3
7440-50-8	Copper and compounds	2.00E-5	2.00E-5	4.00E-5	2.00E-5	2.56E-5			1.75E-4
7440-62-2	Vanadium (fume or dust)	5.41E-5	5.41E-5	1.08E-4	5.41E-5	2.31E-5			1.58E-4
7440-66-6	Zinc and compounds	6.82E-4	6.82E-4	1.36E-3	6.82E-4	2.37E-5			1.62E-4
1313-27-5	Molybdenum trioxide					1.27E-5			8.64E-5
7440-22-4	Silver and compounds					1.34E-5			9.18E-5
7631-86-9	Silica, crystalline (respirable)					9.16E-1			6.25E+0
115-07-1	Propylene	5.52E-3	5.52E-3	1.10E-2	5.52E-3				
107-02-8	Acrolein	1.14E-4	1.14E-4	2.28E-4	1.14E-4				
71-43-2	Benzene	2.63E-4	2.63E-4	5.26E-4	2.63E-4				
108-88-3	Toluene	8.61E-4	8.61E-4	1.72E-3	8.61E-4				
100-41-4	Ethyl benzene	2.24E-4	2.24E-4	4.47E-4	2.24E-4				
91-20-3	Naphthalene	2.62E-5	2.62E-5	5.25E-5	2.62E-5				
7782-49-2	Selenium and compounds	5.65E-7	5.65E-7	1.13E-6	5.65E-7				
91-57-6	2-Methyl naphthalene	5.65E-7	5.65E-7	1.13E-6	5.65E-7				
56-49-5	3-Methylcholanthrene	4.24E-8	4.24E-8	8.47E-8	4.24E-8				
57-97-6	7,12-Dimethylbenz[a]anthracene	3.76E-7	3.76E-7	7.53E-7	3.76E-7				
83-32-9	Acenaphthene	3.27E-8	3.27E-8	6.54E-8	3.27E-8				
208-96-8	Acenaphthylene	2.85E-7	2.85E-7	5.69E-7	2.85E-7				
75-07-0	Acetaldehyde	3.29E-4	3.29E-4	6.58E-4	3.29E-4				
7664-41-7	Ammonia	4.24E-1	4.24E-1	8.47E-1	4.24E-1				
120-12-7	Anthracene	3.79E-8	3.79E-8	7.58E-8	3.79E-8				
56-55-3	Benz[a]anthracene	4.61E-8	4.61E-8	9.22E-8	4.61E-8				
50-32-8	Benzo[a]pyrene	2.31E-8	2.31E-8	4.61E-8	2.31E-8				
205-99-2	Benzo[b]fluoranthene	2.68E-8	2.68E-8	5.36E-8	2.68E-8				
191-24-2	Benzo[g,h,i]perylene	2.94E-8	2.94E-8	5.88E-8	2.94E-8				
207-08-9	Benzo[k]fluoranthene	2.33E-8	2.33E-8	4.66E-8	2.33E-8				
218-01-9	Chrysene	3.27E-8	3.27E-8	6.54E-8	3.27E-8				
53-70-3	Dibenz[a,h]anthracene	2.16E-8	2.16E-8	4.32E-8	2.16E-8				
206-44-0	Fluoranthene	2.80E-7	2.80E-7	5.60E-7	2.80E-7				

CAS	Chemical Name	HL	HWW	HTW	HMO	CKD	EW	MR	MFP
86-73-7	Fluorene	1.08E-7	1.08E-7	2.16E-7	1.08E-7				
50-00-0	Formaldehyde	1.74E-3	1.74E-3	3.48E-3	1.74E-3				
110-54-3	Hexane	4.24E-2	4.24E-2	8.47E-2	4.24E-2				
193-39-5	Indeno[1,2,3-cd]pyrene	2.75E-8	2.75E-8	5.51E-8	2.75E-8				
106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)	2.82E-5	2.82E-5	5.65E-5	2.82E-5				
85-01-8	Phenanthrene	7.93E-7	7.93E-7	1.59E-6	7.93E-7				
129-00-0	Pyrene	1.32E-7	1.32E-7	2.64E-7	1.32E-7				
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	6.40E-4	6.40E-4	1.28E-3	6.40E-4				
74-90-8	Cyanide, Hydrogen						1.10E-1		

Table C-2. TAC Emissions by TEU for Acute Exposure (cont.)

CAS	Chemical Name	MFHG	UFD	AFD	TSF	POND	LEACH1	LEACH2	CILTANK1
7440-36-0	Antimony and compounds		6.08E-5	7.71E-4					
7440-38-2	Arsenic and compounds		2.21E-4	2.34E-3					
7440-41-7	Beryllium and compounds		1.68E-6	2.79E-5					
7440-43-9	Cadmium and compounds		2.90E-7	3.39E-6					
18540-29-9	Chromium VI, chromate, and dichromate particulate		3.95E-5	3.86E-4					
7440-48-4	Cobalt and compounds		2.25E-6	4.19E-5					
7439-92-1	Lead and compounds		9.58E-6	1.31E-4					
7439-96-5	Manganese and compounds		1.13E-4	1.53E-3					
7439-97-6	Mercury and compounds	4.14E-2	3.26E-6	3.90E-5					
C365	Nickel compounds, insoluble		6.65E-6	7.35E-5					
7440-39-3	Barium and compounds		9.65E-4	1.18E-2					
7440-50-8	Copper and compounds		2.45E-5	1.79E-4					
7440-62-2	Vanadium (fume or dust)		2.38E-5	3.21E-4					
7440-66-6	Zinc and compounds		2.40E-5	2.97E-4					
1313-27-5	Molybdenum trioxide		1.24E-5	1.14E-4					
7440-22-4	Silver and compounds		1.24E-5	4.83E-5					
7631-86-9	Silica, crystalline (respirable)		4.61E-1	5.30E+0					
74-90-8	Cyanide, Hydrogen				4.40E+0	1.05E+0	1.15E+0	1.15E+0	5.74E-1

Table C-2. TAC Emissions by TEU for Acute Exposure (cont.)

CAS	Chemical Name	CILTANK2	CILTANK3	CILTANK4	CILTANK5	CILTANK6	CILTANK7	CEM1	CEM2
7440-38-2	Arsenic and compounds							1.14E-5	1.14E-5
7440-41-7	Beryllium and compounds							1.04E-6	1.04E-6
7440-43-9	Cadmium and compounds							3.25E-7	3.25E-7
18540-29-9	Chromium VI, chromate, and dichromate particulate							1.55E-5	1.55E-5
7439-92-1	Lead and compounds							6.52E-6	6.52E-6
7439-96-5	Manganese and compounds							1.09E-5	1.09E-5
C365	Nickel compounds, insoluble							2.82E-5	2.82E-5
7631-86-9	Silica, crystalline (respirable)							5.44E-4	5.44E-4
7782-49-2	Selenium and compounds							8.03E-7	8.03E-7
74-90-8	Cyanide, Hydrogen	5.74E-1	5.74E-1	5.74E-1	5.74E-1	5.74E-1	5.74E-1		
12185-10-3	Phosphorus, white							5.55E-5	5.55E-5

Table C-2. TAC Emissions by TEU for Acute Exposure (cont.)

CAS	Chemical Name	CEM3	CEM4	CEM5	UDP	EDG1	MFD	EDFP	LS1
7440-36-0	Antimony and compounds	3.77E-4	2.62E-4						
7440-38-2	Arsenic and compounds	1.11E-3	7.70E-4	2.51E-5	1.26E-3	5.26E-3	5.25E-5	5.26E-4	
7440-41-7	Beryllium and compounds	1.42E-5	9.88E-6						
7440-43-9	Cadmium and compounds	1.63E-6	1.13E-6	6.03E-8	1.18E-3	4.93E-3	4.93E-5	4.93E-4	
18540-29-9	Chromium VI, chromate, and dichromate particulate	1.79E-4	1.25E-4	1.08E-5	7.89E-5	3.29E-4	3.28E-6	3.29E-5	
7440-48-4	Cobalt and compounds	2.16E-5	1.50E-5						
7439-92-1	Lead and compounds	6.46E-5	4.49E-5	3.11E-6	6.55E-3	2.73E-2	2.73E-4	2.73E-3	
7439-96-5	Manganese and compounds	7.58E-4	5.28E-4	3.21E-4	2.45E-3	1.02E-2	1.02E-4	1.02E-3	
7439-97-6	Mercury and compounds	1.89E-5	1.31E-5		1.58E-3	6.58E-3	6.57E-5	6.58E-4	
C365	Nickel compounds, insoluble	3.50E-5	2.44E-5	2.11E-5	3.08E-3	1.28E-2	1.28E-4	1.28E-3	
7440-39-3	Barium and compounds	5.72E-3	3.98E-3						
7440-50-8	Copper and compounds	7.67E-5	5.34E-5		3.24E-3	1.35E-2	1.35E-4	1.35E-3	
7440-62-2	Vanadium (fume or dust)	1.58E-4	1.10E-4						
7440-66-6	Zinc and compounds	1.44E-4	1.00E-4		1.77E-2	7.37E-2	7.36E-4	7.37E-3	
1313-27-5	Molybdenum trioxide	5.19E-5	3.61E-5						
7440-22-4	Silver and compounds	1.45E-5	1.01E-5						
7631-86-9	Silica, crystalline (respirable)	2.36E+0	2.00E+0	1.09E-3					1.87E-7
115-07-1	Propylene				3.69E-1	1.54E+0	3.28E-4	1.54E-1	
106-99-0	1,3-Butadiene				1.72E-1	7.15E-1	4.86E-4	7.15E-2	
107-02-8	Acrolein				2.68E-2	1.11E-1	1.15E-2	1.11E-2	
71-43-2	Benzene				1.47E-1	6.13E-1	1.44E-4	6.13E-2	
108-88-3	Toluene				8.32E-2	3.47E-1	1.44E-4	3.47E-2	
100-41-4	Ethyl benzene				8.60E-3	3.58E-2	6.57E-6	3.58E-3	

CAS	Chemical Name	CEM3	CEM4	CEM5	UDP	EDG1	MFD	EDFP	LS1
91-20-3	Naphthalene				1.55E-2	6.48E-2	1.74E-4	6.48E-3	
7782-49-2	Selenium and compounds				1.74E-3	7.24E-3	7.22E-5	7.24E-4	
91-57-6	2-Methyl naphthalene						4.60E-6		
83-32-9	Acenaphthene				2.64E-3	1.10E-2	6.93E-6	1.10E-3	
208-96-8	Acenaphthylene				3.21E-3	1.34E-2	2.13E-6	1.34E-3	
75-07-0	Acetaldehyde				6.18E-1	2.58E+0	1.15E-2	2.58E-1	
7664-41-7	Ammonia				2.29E+0	9.54E+0	9.52E-2	9.54E-1	
120-12-7	Anthracene				3.17E-3	1.32E-2	7.85E-7	1.32E-3	
56-55-3	Benz[a]anthracene				3.08E-3	1.28E-2	4.43E-7	1.28E-3	
50-32-8	Benzo[a]pyrene				2.80E-5	1.17E-4	2.48E-7	1.17E-5	
205-99-2	Benzo[b]fluoranthene				5.29E-3	2.20E-2	2.19E-7	2.20E-3	
191-24-2	Benzo[g,h,i]perylene				2.25E-6	9.37E-6	2.79E-7	9.37E-7	
207-08-9	Benzo[k]fluoranthene				5.29E-3	2.20E-2	2.73E-6	2.20E-3	
218-01-9	Chrysene				2.82E-3	1.18E-2	4.20E-7	1.18E-3	
53-70-3	Dibenz[a,h]anthracene				2.76E-3	1.15E-2	2.13E-7	1.15E-3	
206-44-0	Fluoranthene				3.15E-3	1.31E-2	1.09E-6	1.31E-3	
86-73-7	Fluorene				1.67E-2	6.94E-2	3.84E-6	6.94E-3	
50-00-0	Formaldehyde				1.36E+0	5.68E+0	1.15E-2	5.68E-1	
110-54-3	Hexane				2.12E-2	8.85E-2	1.15E-4	8.85E-3	
193-39-5	Indeno[1,2,3-cd]pyrene				2.73E-3	1.14E-2	2.18E-7	1.14E-3	
85-01-8	Phenanthrene				3.08E-2	1.28E-1	1.22E-5	1.28E-2	
129-00-0	Pyrene				6.65E-3	2.77E-2	1.34E-6	2.77E-3	
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene				3.35E-1	1.39E+0	5.25E-5	1.39E-1	
12185-10-3	Phosphorus, white			1.36E-4					
108-90-7	Chlorobenzene				1.58E-4	6.58E-4	6.57E-6	6.58E-5	
7647-01-0	Hydrochloric Acid				1.47E-1	6.13E-1	6.12E-3	6.13E-2	
C200	Diesel Particulate Matter				2.64E+1	2.44E+2		2.44E+1	
192-97-2	Benzo[e]pyrene						4.60E-7		
198-55-0	Perylene						8.90E-7		

Table C-2. TAC Emissions by TEU for Acute Exposure (cont.)

CAS	Chemical Name	LS2	TG1	TD1	TD2
7439-97-6	Mercury and compounds			8.96E-9	9.42E-10
7631-86-9	Silica, crystalline (respirable)	2.52E-8			
71-43-2	Benzene		9.13E-2	1.88E-7	1.98E-8
108-88-3	Toluene		3.66E-1	7.17E-6	7.54E-7
100-41-4	Ethyl benzene		8.15E-2	2.91E-6	3.06E-7
100-42-5	Styrene			7.17E-6	7.54E-7
91-20-3	Naphthalene		2.25E-2	1.23E-4	1.30E-5
110-54-3	Hexane		3.62E-1	2.24E-4	2.36E-5
85-01-8	Phenanthrene			2.80E-5	2.95E-6
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene		3.64E-1	6.50E-5	6.83E-6
92-52-4	Biphenyl		5.07E-4	2.24E-5	2.36E-6
110-82-7	Cyclohexane		1.22E-2		
108-95-2	Phenol		2.79E-3	1.43E-5	1.51E-6
95-63-6	1,2,4-Trimethylbenzene		1.27E-1	2.24E-4	2.36E-5
98-82-8	Isopropylbenzene (Cumene)		2.54E-2		

Appendix D – List of CAO Exposure Locations

Because of the large number of Acute receptors, they are excluded here and provided digitally.

Table D-1. Exposure Locations and Zoning Crosswalk for Non-Acute Classified Receptors

Easting	Northing	Risk Classification	OR Zoning Code	Zoning Description
481167.0	4835722.0	Residential	RNG	Federal Range
484473.0	4838898.0	Residential	RNG	Federal Range
486593.0	4842860.0	Residential	EFU80	Exclusive Farm Use 80
485667.0	4843772.0	Residential	EFU80	Exclusive Farm Use 80
467702.0	4839557.0	Worker	RNG	Federal Range
474243.0	4839495.0	Worker	RNG	Federal Range
466286.6	4829470.7	Worker	RNG	Federal Range
451130.0	4857129.0	Child	RC	Residential-Commercial
480485.0	4869487.0	Child	MDR	Medium Density Residential
494402.0	4843162.0	Child	No zoning class	
479000.0	4828500.0	Residential	RNG	Federal Range
479000.0	4829000.0	Residential	No zoning class	
479000.0	4829500.0	Residential	No zoning class	
479000.0	4834500.0	Residential	RNG	Federal Range
479000.0	4835000.0	Residential	No zoning class	
479500.0	4828500.0	Residential	RNG	Federal Range
479500.0	4829000.0	Residential	No zoning class	
479500.0	4829500.0	Residential	No zoning class	
479500.0	4834500.0	Residential	RNG	Federal Range
479500.0	4835000.0	Residential	RNG	Federal Range
480000.0	4832500.0	Residential	RNG	Federal Range
480000.0	4833000.0	Residential	RNG	Federal Range
480000.0	4833500.0	Residential	RNG	Federal Range
480500.0	4830000.0	Residential	No zoning class	
480500.0	4832500.0	Residential	RNG	Federal Range
480500.0	4833000.0	Residential	RNG	Federal Range
481000.0	4835500.0	Residential	RNG	Federal Range
481000.0	4836000.0	Residential	RNG	Federal Range
481500.0	4836000.0	Residential	RNG	Federal Range
428000.0	4832000.0	Residential	RNG	Federal Range
428000.0	4838000.0	Residential	RNG	Federal Range
430000.0	4828000.0	Residential	RNG	Federal Range
434000.0	4816000.0	Residential	RNG	Federal Range
438000.0	4846000.0	Residential	RNG	Federal Range
442000.0	4870000.0	Residential	RNG	Federal Range

Easting	Northing	Risk Classification	OR Zoning Code	Zoning Description
442000.0	4874000.0	Residential	RNG	Federal Range
444000.0	4870000.0	Residential	RNG	Federal Range
444000.0	4872000.0	Residential	RNG	Federal Range
446000.0	4870000.0	Residential	RNG	Federal Range
448000.0	4854000.0	Residential	EFU160	Exclusive Farm Use 160+
448000.0	4856000.0	Residential	EFU160	Exclusive Farm Use 160+
448000.0	4870000.0	Residential	RNG	Federal Range
448000.0	4874000.0	Residential	RNG	Federal Range
450000.0	4854000.0	Residential	RNG	Federal Range
450000.0	4858000.0	Residential	EFU80	Exclusive Farm Use 80
452000.0	4856000.0	Residential	RNG	Federal Range
454000.0	4854000.0	Residential	RNG	Federal Range
454000.0	4858000.0	Residential	EFU80	Exclusive Farm Use 80
454000.0	4860000.0	Residential	EFU160	Exclusive Farm Use 160+
456000.0	4858000.0	Residential	RNG	Federal Range
456000.0	4860000.0	Residential	EFU80	Exclusive Farm Use 80
458000.0	4858000.0	Residential	EFU160	Exclusive Farm Use 160+
458000.0	4860000.0	Residential	RNG	Federal Range
458000.0	4876000.0	Residential	RNG	Federal Range
460000.0	4786000.0	Residential	RNG	Federal Range
460000.0	4860000.0	Residential	EFU80	Exclusive Farm Use 80
460000.0	4876000.0	Residential	RNG	Federal Range
462000.0	4808000.0	Residential	RNG	Federal Range
462000.0	4866000.0	Residential	RNG	Federal Range
466000.0	4866000.0	Residential	EFU80	Exclusive Farm Use 80
466000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
466000.0	4886000.0	Residential	RNG	Federal Range
468000.0	4864000.0	Residential	RNG	Federal Range
468000.0	4866000.0	Residential	EFU80	Exclusive Farm Use 80
468000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
468000.0	4874000.0	Residential	RNG	Federal Range
468000.0	4884000.0	Residential	EFU160	Exclusive Farm Use 160+
468000.0	4886000.0	Residential	EFU80	Exclusive Farm Use 80
470000.0	4864000.0	Residential	EFU80	Exclusive Farm Use 80
470000.0	4866000.0	Residential	EFU80	Exclusive Farm Use 80
470000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
470000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
470000.0	4872000.0	Residential	EFU160	Exclusive Farm Use 160+
470000.0	4882000.0	Residential	EFU80	Exclusive Farm Use 80
470000.0	4884000.0	Residential	EFU80	Exclusive Farm Use 80
470000.0	4886000.0	Residential	EFU80	Exclusive Farm Use 80

Easting	Northing	Risk Classification	OR Zoning Code	Zoning Description
472000.0	4808000.0	Residential	RNG	Federal Range
472000.0	4814000.0	Residential	RNG	Federal Range
472000.0	4816000.0	Residential	RNG	Federal Range
472000.0	4818000.0	Residential	No zoning class	
472000.0	4820000.0	Residential	RNG	Federal Range
472000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
472000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
472000.0	4872000.0	Residential	RNG	Federal Range
472000.0	4880000.0	Residential	RNG	Federal Range
472000.0	4882000.0	Residential	EFU80	Exclusive Farm Use 80
472000.0	4884000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4862000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4864000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4866000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4872000.0	Residential	RNG	Federal Range
474000.0	4878000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4880000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4882000.0	Residential	EFU80	Exclusive Farm Use 80
474000.0	4884000.0	Residential	EFU160	Exclusive Farm Use 160+
476000.0	4862000.0	Residential	EFU160	Exclusive Farm Use 160+
476000.0	4864000.0	Residential	EFU80	Exclusive Farm Use 80
476000.0	4866000.0	Residential	No zoning class	
476000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
476000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
476000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
476000.0	4878000.0	Residential	EFU80	Exclusive Farm Use 80
476000.0	4880000.0	Residential	EFU80	Exclusive Farm Use 80
476000.0	4882000.0	Residential	RNG	Federal Range
478000.0	4864000.0	Residential	EFU160	Exclusive Farm Use 160+
478000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
478000.0	4870000.0	Residential	RR1	Rural Residential 1 acre
478000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
478000.0	4874000.0	Residential	EFU80	Exclusive Farm Use 80
478000.0	4876000.0	Residential	EFU80	Exclusive Farm Use 80
478000.0	4878000.0	Residential	EFU80	Exclusive Farm Use 80
478000.0	4880000.0	Residential	RNG	Federal Range
480000.0	4866000.0	Residential	RNG	Federal Range
480000.0	4868000.0	Residential	IL	Industrial - Light
480000.0	4870000.0	Residential	No zoning class	

Easting	Northing	Risk Classification	OR Zoning Code	Zoning Description
480000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
480000.0	4874000.0	Residential	EFU80	Exclusive Farm Use 80
482000.0	4866000.0	Residential	RNG	Federal Range
482000.0	4868000.0	Residential	RNG	Federal Range
482000.0	4870000.0	Residential	RR1	Rural Residential 1 acre
482000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
482000.0	4874000.0	Residential	RNG	Federal Range
482000.0	4876000.0	Residential	RNG	Federal Range
484000.0	4850000.0	Residential	EFU160	Exclusive Farm Use 160+
484000.0	4854000.0	Residential	RNG	Federal Range
484000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
484000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
486000.0	4832000.0	Residential	RNG	Federal Range
486000.0	4844000.0	Residential	EFU160	Exclusive Farm Use 160+
486000.0	4848000.0	Residential	EFU80	Exclusive Farm Use 80
486000.0	4850000.0	Residential	EFU80	Exclusive Farm Use 80
486000.0	4852000.0	Residential	EFU80	Exclusive Farm Use 80
486000.0	4854000.0	Residential	EFU80	Exclusive Farm Use 80
486000.0	4862000.0	Residential	RNG	Federal Range
486000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
486000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
486000.0	4874000.0	Residential	RNG	Federal Range
488000.0	4844000.0	Residential	EFU80	Exclusive Farm Use 80
488000.0	4846000.0	Residential	EFU80	Exclusive Farm Use 80
488000.0	4848000.0	Residential	EFU80	Exclusive Farm Use 80
488000.0	4850000.0	Residential	EFU80	Exclusive Farm Use 80
488000.0	4852000.0	Residential	EFU80	Exclusive Farm Use 80
488000.0	4858000.0	Residential	RNG	Federal Range
488000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
488000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
488000.0	4874000.0	Residential	EFU80	Exclusive Farm Use 80
488000.0	4876000.0	Residential	RNG	Federal Range
490000.0	4844000.0	Residential	EFU80	Exclusive Farm Use 80
490000.0	4846000.0	Residential	EFU80	Exclusive Farm Use 80
490000.0	4850000.0	Residential	EFU80	Exclusive Farm Use 80
490000.0	4852000.0	Residential	EFU80	Exclusive Farm Use 80
490000.0	4854000.0	Residential	EFU80	Exclusive Farm Use 80
490000.0	4856000.0	Residential	No zoning class	
490000.0	4868000.0	Residential	EFU160	Exclusive Farm Use 160+
490000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
490000.0	4874000.0	Residential	EFU80	Exclusive Farm Use 80

Easting	Northing	Risk Classification	OR Zoning Code	Zoning Description
492000.0	4822000.0	Residential	RNG	Federal Range
492000.0	4838000.0	Residential	RNG	Federal Range
492000.0	4842000.0	Residential	RNG	Federal Range
492000.0	4844000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4846000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4848000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4850000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4852000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4854000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4856000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4860000.0	Residential	RNG	Federal Range
492000.0	4862000.0	Residential	RNG	Federal Range
492000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
492000.0	4874000.0	Residential	EFU160	Exclusive Farm Use 160+
494000.0	4792000.0	Residential	RNG	Federal Range
494000.0	4794000.0	Residential	RNG	Federal Range
494000.0	4830000.0	Residential	EFU160	Exclusive Farm Use 160+
494000.0	4832000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4834000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4836000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4838000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4840000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4842000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4844000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4846000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4848000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4850000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4852000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4854000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4856000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4860000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4862000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4872000.0	Residential	No zoning class	
494000.0	4874000.0	Residential	EFU80	Exclusive Farm Use 80
494000.0	4880000.0	Residential	RNG	Federal Range
496000.0	4828000.0	Residential	EFU160	Exclusive Farm Use 160+
496000.0	4830000.0	Residential	EFU80	Exclusive Farm Use 80

Easting	Northing	Risk Classification	OR Zoning Code	Zoning Description
496000.0	4836000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4838000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4840000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4842000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4844000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4846000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4848000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4850000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4852000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4854000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4858000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4860000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4862000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4864000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4874000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4876000.0	Residential	EFU80	Exclusive Farm Use 80
496000.0	4878000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4852000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4856000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4858000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4860000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4862000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4864000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4866000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4874000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4876000.0	Residential	EFU80	Exclusive Farm Use 80
498000.0	4878000.0	Residential	EFU80	Exclusive Farm Use 80
500000.0	4860000.0	Residential	MDR	Medium Density Residential
500000.0	4862000.0	Residential	EFU80	Exclusive Farm Use 80
500000.0	4864000.0	Residential	EFU80	Exclusive Farm Use 80
500000.0	4866000.0	Residential	EFU80	Exclusive Farm Use 80
500000.0	4868000.0	Residential	EFU80	Exclusive Farm Use 80
500000.0	4870000.0	Residential	EFU80	Exclusive Farm Use 80
500000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
500000.0	4874000.0	Residential	EFU160	Exclusive Farm Use 160+
500000.0	4876000.0	Residential	IH	Industrial - Heavy

Easting	Northing	Risk Classification	OR Zoning Code	Zoning Description
502000.0	4864000.0	Residential	EFU80	Exclusive Farm Use 80
502000.0	4866000.0	Residential	EFU80	Exclusive Farm Use 80
502000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
502000.0	4874000.0	Residential	PF	Public & semi-public Uses
504000.0	4872000.0	Residential	EFU80	Exclusive Farm Use 80
504000.0	4874000.0	Residential	MHDR	Medium High Density Residential

Appendix E – REER Calculations

TEU	CAS	TAC	Emissions				Residential				Non-Residential Child				Non-Residential Worker				Acute	
			Annual		Daily		Cancer		Noncancer		Cancer		Noncancer		Cancer		Noncancer			
			lb/yr	g/s	lb/day	g/s	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)
OC	7440-36-0	Antimony and compounds	7.41E-2	1.07E-6	2.03E-4	1.07E-6			3.00E-1	3.55E-6			1.30E+0	8.19E-7			1.30E+0	8.19E-7	1.00E+0	1.07E-6
	7440-38-2	Arsenic and compounds	2.76E-1	3.96E-6	7.55E-4	3.96E-6	2.40E-5	1.65E-1	1.70E-4	2.33E-2	1.30E-3	3.05E-3	2.40E-3	1.65E-3	6.20E-4	6.39E-3	2.40E-3	1.65E-3	2.00E-1	1.98E-5
	7440-41-7	Beryllium and compounds	1.95E-3	2.80E-8	5.34E-6	2.80E-8	4.20E-4	6.67E-5	7.00E-3	4.00E-6	1.10E-2	2.55E-6	3.10E-2	9.04E-7	5.00E-3	5.60E-6	3.10E-2	9.04E-7	2.00E-2	1.40E-6
	7440-43-9	Cadmium and compounds	3.57E-4	5.14E-9	9.79E-7	5.14E-9	5.60E-4	9.18E-6	5.00E-3	1.03E-6	1.40E-2	3.67E-7	3.70E-2	1.39E-7	6.70E-3	7.67E-7	3.70E-2	1.39E-7	3.00E-2	1.71E-7
	18540-29-9	Chromium VI, chromate, and dichromate particulate	4.98E-2	7.16E-7	1.36E-4	7.16E-7	3.10E-5	2.31E-2	8.30E-2	8.63E-6	5.20E-4	1.38E-3	8.80E-1	8.14E-7	1.00E-3	7.16E-4	8.80E-1	8.14E-7	3.00E-1	2.39E-6
	7440-48-4	Cobalt and compounds	2.54E-3	3.65E-8	6.95E-6	3.65E-8			1.00E-1	3.65E-7			4.40E-1	8.30E-8			4.40E-1	8.30E-8		
	7439-92-1	Lead and compounds	1.15E-2	1.66E-7	3.16E-5	1.66E-7			1.50E-1	1.11E-6			6.60E-1	2.51E-7			6.60E-1	2.51E-7	1.50E-1	1.11E-6
	7439-96-5	Manganese and compounds	1.36E-1	1.95E-6	3.71E-4	1.95E-6			9.00E-2	2.17E-5			4.00E-1	4.87E-6			4.00E-1	4.87E-6	3.00E-1	6.50E-6
	7439-97-6	Mercury and compounds	4.00E-3	5.76E-8	1.10E-5	5.76E-8			7.70E-2	7.48E-7			6.30E-1	9.14E-8			6.30E-1	9.14E-8	6.00E-1	9.60E-8
	C365	Nickel compounds, insoluble	8.26E-3	1.19E-7	2.26E-5	1.19E-7	3.80E-3	3.13E-5	1.40E-2	8.48E-6	1.00E-1	1.19E-6	6.20E-2	1.92E-6	4.60E-2	2.58E-6	6.20E-2	1.92E-6	2.00E-1	5.94E-7
	7440-39-3	Barium and compounds	1.18E+0	1.70E-5	3.24E-3	1.70E-5														
	7440-50-8	Copper and compounds	3.18E-2	4.58E-7	8.72E-5	4.58E-7													1.00E+2	4.58E-9
	7440-62-2	Vanadium (fume or dust)	2.87E-2	4.13E-7	7.86E-5	4.13E-7			1.00E-1	4.13E-6			4.40E-1	9.38E-7			4.40E-1	9.38E-7	8.00E-1	5.16E-7
	7440-66-6	Zinc and compounds	2.94E-2	4.23E-7	8.05E-5	4.23E-7														
	1313-27-5	Molybdenum trioxide	1.57E-2	2.26E-7	4.30E-5	2.26E-7														
	7440-22-4	Silver and compounds	1.67E-2	2.40E-7	4.57E-5	2.40E-7														
	7631-86-9	Silica, crystalline (respirable)	4.32E+2	6.21E-3	1.18E+0	6.21E-3			3.00E+0	2.07E-3			1.30E+1	4.78E-4			1.30E+1	4.78E-4		
		Total REER						**1.88E-1**		**2.54E-2**		**4.43E-3**		**2.14E-3**		**7.12E-3**		**2.14E-3**		**3.37E-5**
BC	7440-36-0	Antimony and compounds	6.81E-1	9.79E-6	2.62E-3	1.37E-5			3.00E-1	3.26E-5			1.30E+0	7.53E-6			1.30E+0	7.53E-6	1.00E+0	1.37E-5
	7440-38-2	Arsenic and compounds	2.00E+0	2.88E-5	7.70E-3	4.04E-5	2.40E-5	1.20E+0	1.70E-4	1.69E-1	1.30E-3	2.21E-2	2.40E-3	1.20E-2	6.20E-4	4.64E-2	2.40E-3	1.20E-2	2.00E-1	2.02E-4
	7440-41-7	Beryllium and compounds	2.57E-2	3.69E-7	9.87E-5	5.18E-7	4.20E-4	8.79E-4	7.00E-3	5.28E-5	1.10E-2	3.36E-5	3.10E-2	1.19E-5	5.00E-3	7.39E-5	3.10E-2	1.19E-5	2.00E-2	2.59E-5
	7440-43-9	Cadmium and compounds	2.95E-3	4.24E-8	1.13E-5	5.95E-8	5.60E-4	7.57E-5	5.00E-3	8.48E-6	1.40E-2	3.03E-6	3.70E-2	1.15E-6	6.70E-3	6.32E-6	3.70E-2	1.15E-6	3.00E-2	1.98E-6
	18540-29-9	Chromium VI, chromate, and dichromate particulate	3.24E-1	4.66E-6	1.24E-3	6.54E-6	3.10E-5	1.50E-1	8.30E-2	5.61E-5	5.20E-4	8.95E-3	8.80E-1	5.29E-6	1.00E-3	4.66E-3	8.80E-1	5.29E-6	3.00E-1	2.18E-5
	7440-48-4	Cobalt and compounds	3.90E-2	5.61E-7	1.50E-4	7.88E-7			1.00E-1	5.61E-6			4.40E-1	1.27E-6			4.40E-1	1.27E-6		
	7439-92-1	Lead and compounds	1.17E-1	1.68E-6	4.49E-4	2.36E-6			1.50E-1	1.12E-5			6.60E-1	2.54E-6			6.60E-1	2.54E-6	1.50E-1	1.57E-5
	7439-96-5	Manganese and compounds	1.37E+0	1.97E-5	5.27E-3	2.77E-5			9.00E-2	2.19E-4			4.00E-1	4.93E-5			4.00E-1	4.93E-5	3.00E-1	9.23E-5
	7439-97-6	Mercury and compounds	3.41E-2	4.90E-7	1.31E-4	6.88E-7			7.70E-2	6.37E-6			6.30E-1	7.78E-7			6.30E-1	7.78E-7	6.00E-1	1.15E-6
	C365	Nickel compounds, insoluble	6.33E-2	9.10E-7	2.43E-4	1.28E-6	3.80E-3	2.39E-4	1.40E-2	6.50E-5	1.00E-1	9.10E-6	6.20E-2	1.47E-5	4.60E-2	1.98E-5	6.20E-2	1.47E-5	2.00E-1	6.39E-6
	7440-39-3	Barium and compounds	1.03E+1	1.49E-4	3.97E-2	2.09E-4														
	7440-50-8	Copper and compounds	1.39E-1	1.99E-6	5.33E-4	2.80E-6													1.00E+2	2.80E-8
	7440-62-2	Vanadium (fume or dust)	2.86E-1	4.12E-6	1.10E-3	5.78E-6			1.00E-1	4.12E-5			4.40E-1	9.36E-6			4.40E-1	9.36E-6	8.00E-1	7.22E-6
	7440-66-6	Zinc and compounds	2.61E-1	3.75E-6	1.00E-3	5.27E-6														
	1313-27-5	Molybdenum trioxide	9.39E-2	1.35E-6	3.61E-4	1.90E-6														
	7440-22-4	Silver and compounds	2.62E-2	3.77E-7	1.01E-4	5.30E-7														
	7631-86-9	Silica, crystalline (respirable)	3.33E+3	4.79E-2	1.28E+1	6.72E-2			3.00E+0	1.60E-2			1.30E+1	3.68E-3			1.30E+1	3.68E-3		
		Total REER						**1.35E+0**		**1.86E-1**		**3.11E-2**		**1.58E-2**		**5.12E-2**		**1.58E-2**		**3.88E-4**
UB	115-07-1	Propylene	1.48E+1	2.13E-4	7.12E-2	3.74E-4			3.00E+3	7.10E-8			1.30E+4	1.64E-8			1.30E+4	1.64E-8		
	106-99-0	1,3-Butadiene	8.04E-1	1.16E-5	3.87E-3	2.03E-5	3.30E-2	3.50E-4	2.00E+0	5.78E-6	8.60E-1	1.34E-5	8.80E+0	1.31E-6	4.00E-1	2.89E-5	8.80E+0	1.31E-6	6.60E+2	3.08E-8
	75-05-8	Acetonitrile	1.06E+1	1.52E-4	5.09E-2	2.67E-4			6.00E+1	2.54E-6			2.60E+2	5.85E-7			2.60E+2	5.85E-7		
	107-02-8	Acrolein	1.06E+0	1.52E-5	5.09E-3	2.67E-5			3.50E-1	4.35E-5			1.50E+0	1.01E-5			1.50E+0	1.01E-5	6.90E+0	3.87E-6
	67-64-1	Acetone	7.19E-1	1.03E-5	3.46E-3	1.82E-5			3.10E+4	3.34E-10			1.40E+5	7.39E-11			1.40E+5	7.39E-11	6.20E+4	2.93E-10
	67-63-0	Isopropyl alcohol	1.38E+0	1.98E-5	6.61E-3	3.47E-5			2.00E+2	9.89E-8			8.80E+2	2.25E-8			8.80E+2	2.25E-8	3.20E+3	1.08E-8
	107-13-1	Acrylonitrile	2.01E+0	2.89E-5	9.66E-3	5.07E-5	1.50E-2	1.93E-3	5.00E+0	5.78E-6	3.80E-1	7.61E-5	2.20E+1	1.31E-6	1.80E-1	1.61E-4	2.20E+1	1.31E-6	2.20E+2	2.31E-7
	71-43-2	Benzene	1.27E+1	1.83E-4	6.10E-2	3.20E-4	1.30E-1	1.40E-3	3.00E+0	6.09E-5	3.30E+0	5.53E-5	1.30E+1	1.40E-5	1.50E+0	1.22E-4	1.30E+1	1.40E-5	2.90E+1	1.11E-5
	108-88-3	Toluene	1.90E+0	2.74E-5	9.16E-3	4.81E-5			5.00E+3	5.48E-9			2.20E+4	1.25E-9			2.20E+4	1.25E-9	7.50E+3	6.41E-9
	100-41-4	Ethyl benzene	1.27E-1	1.83E-6	6.10E-4	3.20E-6	4.00E-1	4.57E-6	2.60E+2	7.02E-9	1.00E+1	1.83E-7	1.10E+3	1.66E-9	4.80E+0	3.80E-7	1.10E+3	1.66E-9	2.20E+4	1.46E-10
	100-42-5	Styrene	9.52E-1	1.37E-5	4.58E-3	2.40E-5			1.00E+3	1.37E-8			4.40E+3	3.11E-9			4.40E+3	3.11E-9	2.10E+4	1.14E-9
	108-67-8	1,3,5-Trimethylbenzene	2.96E-1	4.26E-6	1.42E-3	7.48E-6			6.00E+1	7.10E-8			2.60E+2	1.64E-8			2.60E+2	1.64E-8		
	91-20-3	Naphthalene	2.01E+0	2.89E-5	9.66E-3	5.07E-5	2.90E-2	9.97E-4	3.70E+0	7.81E-6	7.60E-1	3.80E-5	1.60E+1	1.81E-6	3.50E-1	8.26E-5	1.60E+1	1.81E-6	2.00E+2	2.54E-7
		Total REER						**4.68E-3**		**1.27E-4**		**1.83E-4**		**2.93E-5**		**3.94E-4**		**2.93E-5**		**1.55E-5**

TEU	CAS	TAC	Emissions				Residential				Non-Residential Child				Non-Residential Worker				Acute	
			Annual		Daily		Cancer		Noncancer		Cancer		Noncancer		Cancer		Noncancer			
			lb/yr	g/s	lb/day	g/s	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)
BRWB	115-07-1	Propylene	1.91E+0	2.75E-5	7.35E-3	3.86E-5			3.00E+3	9.16E-9			1.30E+4	2.11E-9			1.30E+4	2.11E-9		
	106-99-0	1,3-Butadiene	1.04E-1	1.49E-6	3.99E-4	2.09E-6	3.30E-2	4.52E-5	2.00E+0	7.46E-7	8.60E-1	1.74E-6	8.80E+0	1.70E-7	4.00E-1	3.73E-6	8.80E+0	1.70E-7	6.60E+2	3.17E-9
	75-05-8	Acetonitrile	1.37E+0	1.96E-5	5.25E-3	2.76E-5			6.00E+1	3.27E-7			2.60E+2	7.55E-8			2.60E+2	7.55E-8		
	107-02-8	Acrolein	1.37E-1	1.96E-6	5.25E-4	2.76E-6			3.50E-1	5.61E-6			1.50E+0	1.31E-6			1.50E+0	1.31E-6	6.90E+0	3.99E-7
	67-64-1	Acetone	9.28E-2	1.34E-6	3.57E-4	1.87E-6			3.10E+4	4.31E-11			1.40E+5	9.54E-12			1.40E+5	9.54E-12	6.20E+4	3.02E-11
	67-63-0	Isopropyl alcohol	1.77E-1	2.55E-6	6.83E-4	3.58E-6			2.00E+2	1.28E-8			8.80E+2	2.90E-9			8.80E+2	2.90E-9	3.20E+3	1.12E-9
	107-13-1	Acrylonitrile	2.59E-1	3.73E-6	9.98E-4	5.24E-6	1.50E-2	2.49E-4	5.00E+0	7.46E-7	3.80E-1	9.82E-6	2.20E+1	1.70E-7	1.80E-1	2.07E-5	2.20E+1	1.70E-7	2.20E+2	2.38E-8
	71-43-2	Benzene	1.64E+0	2.36E-5	6.30E-3	3.31E-5	1.30E-1	1.81E-4	3.00E+0	7.85E-6	3.30E+0	7.14E-6	1.30E+1	1.81E-6	1.50E+0	1.57E-5	1.30E+1	1.81E-6	2.90E+1	1.14E-6
	108-88-3	Toluene	2.46E-1	3.53E-6	9.45E-4	4.96E-6			5.00E+3	7.07E-10			2.20E+4	1.61E-10			2.20E+4	1.61E-10	7.50E+3	6.61E-10
	100-41-4	Ethyl benzene	1.64E-2	2.36E-7	6.30E-5	3.31E-7	4.00E-1	5.89E-7	2.60E+2	9.06E-10	1.00E+1	2.36E-8	1.10E+3	2.14E-10	4.80E+0	4.91E-8	1.10E+3	2.14E-10	2.20E+4	1.50E-11
	100-42-5	Styrene	1.23E-1	1.77E-6	4.73E-4	2.48E-6			1.00E+3	1.77E-9			4.40E+3	4.02E-10			4.40E+3	4.02E-10	2.10E+4	1.18E-10
	108-67-8	1,3,5-Trimethylbenzene	3.82E-2	5.50E-7	1.47E-4	7.72E-7			6.00E+1	9.16E-9			2.60E+2	2.11E-9			2.60E+2	2.11E-9		
	91-20-3	Naphthalene	2.59E-1	3.73E-6	9.98E-4	5.24E-6	2.90E-2	1.29E-4	3.70E+0	1.01E-6	7.60E-1	4.91E-6	1.60E+1	2.33E-7	3.50E-1	1.07E-5	1.60E+1	2.33E-7	2.00E+2	2.62E-8
		Total REER						**6.04E-4**		**1.63E-5**		**2.36E-5**		**3.78E-6**		**5.09E-5**		**3.78E-6**		**1.60E-6**
UBD	7440-38-2	Arsenic and compounds	4.93E-3	7.10E-8	2.37E-5	1.25E-7	2.40E-5	2.96E-3	1.70E-4	4.17E-4	1.30E-3	5.46E-5	2.40E-3	2.96E-5	6.20E-4	1.14E-4	2.40E-3	2.96E-5	2.00E-1	6.23E-7
	7440-41-7	Beryllium and compounds	3.70E-3	5.32E-8	1.78E-5	9.34E-8	4.20E-4	1.27E-4	7.00E-3	7.60E-6	1.10E-2	4.84E-6	3.10E-2	1.72E-6	5.00E-3	1.06E-5	3.10E-2	1.72E-6	2.00E-2	4.67E-6
	7440-43-9	Cadmium and compounds	3.70E-3	5.32E-8	1.78E-5	9.34E-8	5.60E-4	9.51E-5	5.00E-3	1.06E-5	1.40E-2	3.80E-6	3.70E-2	1.44E-6	6.70E-3	7.94E-6	3.70E-2	1.44E-6	3.00E-2	3.11E-6
	18540-29-9	Chromium VI, chromate, and dichromate particulate	3.70E-3	5.32E-8	1.78E-5	9.34E-8	3.10E-5	1.72E-3	8.30E-2	6.41E-7	5.20E-4	1.02E-4	8.80E-1	6.05E-8	1.00E-3	5.32E-5	8.80E-1	6.05E-8	3.00E-1	3.11E-7
	7440-50-8	Copper and compounds	7.40E-3	1.06E-7	3.56E-5	1.87E-7													1.00E+2	1.87E-9
	7439-92-1	Lead and compounds	1.11E-2	1.60E-7	5.34E-5	2.80E-7			1.50E-1	1.06E-6			6.60E-1	2.42E-7			6.60E-1	2.42E-7	1.50E-1	1.87E-6
	7439-97-6	Mercury and compounds	3.70E-3	5.32E-8	1.78E-5	9.34E-8			7.70E-2	6.91E-7			6.30E-1	8.45E-8			6.30E-1	8.45E-8	6.00E-1	1.56E-7
	7439-96-5	Manganese and compounds	7.40E-3	1.06E-7	3.56E-5	1.87E-7			9.00E-2	1.18E-6			4.00E-1	2.66E-7			4.00E-1	2.66E-7	3.00E-1	6.23E-7
	C365	Nickel compounds, insoluble	3.70E-3	5.32E-8	1.78E-5	9.34E-8	3.80E-3	1.40E-5	1.40E-2	3.80E-6	1.00E-1	5.32E-7	6.20E-2	8.59E-7	4.60E-2	1.16E-6	6.20E-2	8.59E-7	2.00E-1	4.67E-7
	7782-49-2	Selenium and compounds	1.85E-2	2.66E-7	8.90E-5	4.67E-7													2.00E+0	2.34E-7
	7440-66-6	Zinc and compounds	4.93E-3	7.10E-8	2.37E-5	1.25E-7														
		Total REER						**4.91E-3**		**4.43E-4**		**1.66E-4**		**3.42E-5**		**1.87E-4**		**3.42E-5**		**1.21E-5**
BRWBD	7440-38-2	Arsenic and compounds	6.37E-4	9.16E-9	2.45E-6	1.29E-8	2.40E-5	3.82E-4	1.70E-4	5.39E-5	1.30E-3	7.04E-6	2.40E-3	3.82E-6	6.20E-4	1.48E-5	2.40E-3	3.82E-6	2.00E-1	6.43E-8
	7440-41-7	Beryllium and compounds	4.77E-4	6.87E-9	1.84E-6	9.64E-9	4.20E-4	1.64E-5	7.00E-3	9.81E-7	1.10E-2	6.24E-7	3.10E-2	2.22E-7	5.00E-3	1.37E-6	3.10E-2	2.22E-7	2.00E-2	4.82E-7
	7440-43-9	Cadmium and compounds	4.77E-4	6.87E-9	1.84E-6	9.64E-9	5.60E-4	1.23E-5	5.00E-3	1.37E-6	1.40E-2	4.91E-7	3.70E-2	1.86E-7	6.70E-3	1.02E-6	3.70E-2	1.86E-7	3.00E-2	3.21E-7
	18540-29-9	Chromium VI, chromate, and dichromate particulate	4.77E-4	6.87E-9	1.84E-6	9.64E-9	3.10E-5	2.22E-4	8.30E-2	8.27E-8	5.20E-4	1.32E-5	8.80E-1	7.80E-9	1.00E-3	6.87E-6	8.80E-1	7.80E-9	3.00E-1	3.21E-8
	7440-50-8	Copper and compounds	9.55E-4	1.37E-8	3.67E-6	1.93E-8													1.00E+2	1.93E-10
	7439-92-1	Lead and compounds	1.43E-3	2.06E-8	5.51E-6	2.89E-8			1.50E-1	1.37E-7			6.60E-1	3.12E-8			6.60E-1	3.12E-8	1.50E-1	1.93E-7
	7439-97-6	Mercury and compounds	4.77E-4	6.87E-9	1.84E-6	9.64E-9			7.70E-2	8.92E-8			6.30E-1	1.09E-8			6.30E-1	1.09E-8	6.00E-1	1.61E-8
	7439-96-5	Manganese and compounds	9.55E-4	1.37E-8	3.67E-6	1.93E-8			9.00E-2	1.53E-7			4.00E-1	3.43E-8			4.00E-1	3.43E-8	3.00E-1	6.43E-8
	C365	Nickel compounds, insoluble	4.77E-4	6.87E-9	1.84E-6	9.64E-9	3.80E-3	1.81E-6	1.40E-2	4.91E-7	1.00E-1	6.87E-8	6.20E-2	1.11E-7	4.60E-2	1.49E-7	6.20E-2	1.11E-7	2.00E-1	4.82E-8
	7782-49-2	Selenium and compounds	2.39E-3	3.43E-8	9.18E-6	4.82E-8													2.00E+0	2.41E-8
	7440-66-6	Zinc and compounds	6.37E-4	9.16E-9	2.45E-6	1.29E-8														
		Total REER						**6.33E-4**		**5.72E-5**		**2.14E-5**		**4.42E-6**		**2.42E-5**		**4.42E-6**		**1.25E-6**

TEU	CAS	TAC	Emissions				Residential				Non-Residential Child				Non-Residential Worker				Acute	
			Annual		Daily		Cancer		Noncancer		Cancer		Noncancer		Cancer		Noncancer			
			lb/yr	g/s	lb/day	g/s	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)
HA	91-57-6	2-Methyl naphthalene	2.06E-4	2.96E-9	5.65E-7	2.96E-9														
	56-49-5	3-Methylcholanthrene	1.55E-5	2.22E-10	4.24E-8	2.22E-10														
	57-97-6	7,12-Dimethylbenz[a]anthracene	1.37E-4	1.98E-9	3.76E-7	1.98E-9														
	83-32-9	Acenaphthene	1.19E-5	1.72E-10	3.27E-8	1.72E-10														
	208-96-8	Acenaphthylene	1.04E-4	1.49E-9	2.85E-7	1.49E-9														
	75-07-0	Acetaldehyde	1.20E-1	1.73E-6	3.29E-4	1.73E-6	4.50E-1	3.84E-6	1.40E+2	1.23E-8	1.20E+1	1.44E-7	6.20E+2	2.78E-9	5.50E+0	3.14E-7	6.20E+2	2.78E-9	4.70E+2	3.67E-9
	107-02-8	Acrolein	4.16E-2	5.98E-7	1.14E-4	5.98E-7			3.50E-1	1.71E-6			1.50E+0	3.99E-7			1.50E+0	3.99E-7	6.90E+0	8.66E-8
	7664-41-7	Ammonia	1.55E+2	2.22E-3	4.24E-1	2.22E-3			5.00E+2	4.45E-6			2.20E+3	1.01E-6			2.20E+3	1.01E-6	1.20E+3	1.85E-6
	120-12-7	Anthracene	1.38E-5	1.99E-10	3.79E-8	1.99E-10														
	7440-38-2	Arsenic and compounds	1.72E-3	2.47E-8	4.71E-6	2.47E-8	2.40E-5	1.03E-3	1.70E-4	1.45E-4	1.30E-3	1.90E-5	2.40E-3	1.03E-5	6.20E-4	3.98E-5	2.40E-3	1.03E-5	2.00E-1	1.24E-7
	7440-39-3	Barium and compounds	3.78E-2	5.44E-7	1.04E-4	5.44E-7														
	56-55-3	Benz[a]anthracene	1.68E-5	2.42E-10	4.61E-8	2.42E-10	2.10E-4	1.15E-6			7.80E-3	3.10E-8			1.50E-2	1.61E-8				
	71-43-2	Benzene	9.59E-2	1.38E-6	2.63E-4	1.38E-6	1.30E-1	1.06E-5	3.00E+0	4.60E-7	3.30E+0	4.18E-7	1.30E+1	1.06E-7	1.50E+0	9.20E-7	1.30E+1	1.06E-7	2.90E+1	4.76E-8
	50-32-8	Benzo[a]pyrene	8.42E-6	1.21E-10	2.31E-8	1.21E-10	4.30E-5	2.82E-6	2.00E-3	6.05E-8	1.60E-3	7.57E-8	8.80E-3	1.38E-8	3.00E-3	4.04E-8	8.80E-3	1.38E-8	2.00E-3	6.05E-8
	205-99-2	Benzo[b]fluoranthene	9.79E-6	1.41E-10	2.68E-8	1.41E-10	5.30E-5	2.66E-6			2.00E-3	7.04E-8			3.80E-3	3.71E-8				
	191-24-2	Benzo[g,h,i]perylene	1.07E-5	1.54E-10	2.94E-8	1.54E-10	4.70E-3	3.29E-8			1.70E-1	9.08E-10			3.40E-1	4.54E-10				
	207-08-9	Benzo[k]fluoranthene	8.50E-6	1.22E-10	2.33E-8	1.22E-10	1.40E-3	8.74E-8			5.20E-2	2.35E-9			1.00E-1	1.22E-9				
	7440-41-7	Beryllium and compounds	1.03E-4	1.48E-9	2.82E-7	1.48E-9	4.20E-4	3.53E-6	7.00E-3	2.12E-7	1.10E-2	1.35E-7	3.10E-2	4.78E-8	5.00E-3	2.96E-7	3.10E-2	4.78E-8	2.00E-2	7.41E-8
	7440-43-9	Cadmium and compounds	9.45E-3	1.36E-7	2.59E-5	1.36E-7	5.60E-4	2.43E-4	5.00E-3	2.72E-5	1.40E-2	9.71E-6	3.70E-2	3.67E-6	6.70E-3	2.03E-5	3.70E-2	3.67E-6	3.00E-2	4.53E-6
	18540-29-9	Chromium VI, chromate, and dichromate particulate	1.20E-2	1.73E-7	3.29E-5	1.73E-7	3.10E-5	5.58E-3	8.30E-2	2.08E-6	5.20E-4	3.33E-4	8.80E-1	1.97E-7	1.00E-3	1.73E-4	8.80E-1	1.97E-7	3.00E-1	5.76E-7
	218-01-9	Chrysene	1.19E-5	1.72E-10	3.27E-8	1.72E-10	4.30E-4	3.99E-7			1.60E-2	1.07E-8			3.00E-2	5.72E-9				
	7440-48-4	Cobalt and compounds	7.21E-4	1.04E-8	1.98E-6	1.04E-8			1.00E-1	1.04E-7			4.40E-1	2.36E-8			4.40E-1	2.36E-8		
	7440-50-8	Copper and compounds	7.30E-3	1.05E-7	2.00E-5	1.05E-7													1.00E+2	1.05E-9
	53-70-3	Dibenz[a,h]anthracene	7.88E-6	1.13E-10	2.16E-8	1.13E-10	4.30E-6	2.63E-5			1.60E-4	7.08E-7			3.00E-4	3.78E-7				
	100-41-4	Ethyl benzene	8.16E-2	1.17E-6	2.24E-4	1.17E-6	4.00E-1	2.93E-6	2.60E+2	4.51E-9	1.00E+1	1.17E-7	1.10E+3	1.07E-9	4.80E+0	2.44E-7	1.10E+3	1.07E-9	2.20E+4	5.33E-11
	206-44-0	Fluoranthene	1.02E-4	1.47E-9	2.80E-7	1.47E-9	5.30E-4	2.77E-6			2.00E-2	7.35E-8			3.80E-2	3.87E-8				
	86-73-7	Fluorene	3.94E-5	5.67E-10	1.08E-7	5.67E-10														
	50-00-0	Formaldehyde	6.36E-1	9.15E-6	1.74E-3	9.15E-6	1.70E-1	5.38E-5	9.00E+0	1.02E-6	4.30E+0	2.13E-6	4.00E+1	2.29E-7	2.00E+0	4.57E-6	4.00E+1	2.29E-7	4.90E+1	1.87E-7
	110-54-3	Hexane	1.55E+1	2.22E-4	4.24E-2	2.22E-4			7.00E+2	3.18E-7			3.10E+3	7.17E-8			3.10E+3	7.17E-8		
	193-39-5	Indeno[1,2,3-cd]pyrene	1.00E-5	1.45E-10	2.75E-8	1.45E-10	6.10E-4	2.37E-7			2.20E-2	6.57E-9			4.30E-2	3.36E-9				
	7439-96-5	Manganese and compounds	3.26E-3	4.69E-8	8.94E-6	4.69E-8			9.00E-2	5.22E-7			4.00E-1	1.17E-7			4.00E-1	1.17E-7	3.00E-1	1.56E-7
	7439-97-6	Mercury and compounds	2.23E-3	3.21E-8	6.12E-6	3.21E-8			7.70E-2	4.17E-7			6.30E-1	5.10E-8			6.30E-1	5.10E-8	6.00E-1	5.35E-8
	91-20-3	Naphthalene	9.58E-3	1.38E-7	2.62E-5	1.38E-7	2.90E-2	4.75E-6	3.70E+0	3.72E-8	7.60E-1	1.81E-7	1.60E+1	8.61E-9	3.50E-1	3.94E-7	1.60E+1	8.61E-9	2.00E+2	6.89E-10
	C365	Nickel compounds, insoluble	1.80E-2	2.59E-7	4.94E-5	2.59E-7	3.80E-3	6.85E-5	1.40E-2	1.85E-5	1.00E-1	2.59E-6	6.20E-2	4.18E-6	4.60E-2	5.64E-6	6.20E-2	4.18E-6	2.00E-1	1.30E-6
	106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)	1.03E-2	1.48E-7	2.82E-5	1.48E-7	9.10E-2	1.63E-6	6.00E+1	2.47E-9	2.40E+0	6.18E-8	2.60E+2	5.70E-10	1.10E+0	1.35E-7	2.60E+2	5.70E-10	1.20E+4	1.24E-11
	85-01-8	Phenanthrene	2.89E-4	4.16E-9	7.93E-7	4.16E-9														
	115-07-1	Propylene	2.02E+0	2.90E-5	5.52E-3	2.90E-5			3.00E+3	9.67E-9			1.30E+4	2.23E-9			1.30E+4	2.23E-9		
	129-00-0	Pyrene	4.81E-5	6.92E-10	1.32E-7	6.92E-10														
	7782-49-2	Selenium and compounds	2.06E-4	2.96E-9	5.65E-7	2.96E-9													2.00E+0	1.48E-9
	108-88-3	Toluene	3.14E-1	4.52E-6	8.61E-4	4.52E-6			5.00E+3	9.04E-10			2.20E+4	2.06E-10			2.20E+4	2.06E-10	7.50E+3	6.03E-10
	7440-62-2	Vanadium (fume or dust)	1.98E-2	2.84E-7	5.41E-5	2.84E-7			1.00E-1	2.84E-6			4.40E-1	6.46E-7			4.40E-1	6.46E-7	8.00E-1	3.55E-7
	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xyl	2.34E-1	3.36E-6	6.40E-4	3.36E-6			2.20E+2	1.53E-8			9.70E+2	3.46E-9			9.70E+2	3.46E-9	8.70E+3	3.86E-10
	7440-66-6	Zinc and compounds	2.49E-1	3.58E-6	6.82E-4	3.58E-6														
	Total REER							**7.04E-3**		**2.05E-4**		**3.68E-4**		**2.11E-5**		**2.46E-4**		**2.11E-5**		**9.41E-6**

TEU	CAS	TAC	Emissions				Residential				Non-Residential Child				Non-Residential Worker				Acute	
			Annual		Daily		Cancer		Noncancer		Cancer		Noncancer		Cancer		Noncancer			
			lb/yr	g/s	lb/day	g/s	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)
HPO	91-57-6	2-Methyl naphthalene	2.06E-4	2.96E-9	5.65E-7	2.96E-9														
	56-49-5	3-Methylcholanthrene	1.55E-5	2.22E-10	4.24E-8	2.22E-10														
	57-97-6	7,12-Dimethylbenz[a]anthracene	1.37E-4	1.98E-9	3.76E-7	1.98E-9														
	83-32-9	Acenaphthene	1.19E-5	1.72E-10	3.27E-8	1.72E-10														
	208-96-8	Acenaphthylene	1.04E-4	1.49E-9	2.85E-7	1.49E-9														
	75-07-0	Acetaldehyde	1.20E-1	1.73E-6	3.29E-4	1.73E-6	4.50E-1	3.84E-6	1.40E+2	1.23E-8	1.20E+1	1.44E-7	6.20E+2	2.78E-9	5.50E+0	3.14E-7	6.20E+2	2.78E-9	4.70E+2	3.67E-9
	107-02-8	Acrolein	4.16E-2	5.98E-7	1.14E-4	5.98E-7			3.50E-1	1.71E-6			1.50E+0	3.99E-7			1.50E+0	3.99E-7	6.90E+0	8.66E-8
	7664-41-7	Ammonia	1.55E+2	2.22E-3	4.24E-1	2.22E-3			5.00E+2	4.45E-6			2.20E+3	1.01E-6			2.20E+3	1.01E-6	1.20E+3	1.85E-6
	120-12-7	Anthracene	1.38E-5	1.99E-10	3.79E-8	1.99E-10														
	7440-38-2	Arsenic and compounds	1.72E-3	2.47E-8	4.71E-6	2.47E-8	2.40E-5	1.03E-3	1.70E-4	1.45E-4	1.30E-3	1.90E-5	2.40E-3	1.03E-5	6.20E-4	3.98E-5	2.40E-3	1.03E-5	2.00E-1	1.24E-7
	7440-39-3	Barium and compounds	3.78E-2	5.44E-7	1.04E-4	5.44E-7														
	56-55-3	Benz[a]anthracene	1.68E-5	2.42E-10	4.61E-8	2.42E-10	2.10E-4	1.15E-6			7.80E-3	3.10E-8			1.50E-2	1.61E-8				
	71-43-2	Benzene	9.59E-2	1.38E-6	2.63E-4	1.38E-6	1.30E-1	1.06E-5	3.00E+0	4.60E-7	3.30E+0	4.18E-7	1.30E+1	1.06E-7	1.50E+0	9.20E-7	1.30E+1	1.06E-7	2.90E+1	4.76E-8
	50-32-8	Benzo[a]pyrene	8.42E-6	1.21E-10	2.31E-8	1.21E-10	4.30E-5	2.82E-6	2.00E-3	6.05E-8	1.60E-3	7.57E-8	8.80E-3	1.38E-8	3.00E-3	4.04E-8	8.80E-3	1.38E-8	2.00E-3	6.05E-8
	205-99-2	Benzo[b]fluoranthene	9.79E-6	1.41E-10	2.68E-8	1.41E-10	5.30E-5	2.66E-6			2.00E-3	7.04E-8			3.80E-3	3.71E-8				
	191-24-2	Benzo[g,h,i]perylene	1.07E-5	1.54E-10	2.94E-8	1.54E-10	4.70E-3	3.29E-8			1.70E-1	9.08E-10			3.40E-1	4.54E-10				
	207-08-9	Benzo[k]fluoranthene	8.50E-6	1.22E-10	2.33E-8	1.22E-10	1.40E-3	8.74E-8			5.20E-2	2.35E-9			1.00E-1	1.22E-9				
	7440-41-7	Beryllium and compounds	1.03E-4	1.48E-9	2.82E-7	1.48E-9	4.20E-4	3.53E-6	7.00E-3	2.12E-7	1.10E-2	1.35E-7	3.10E-2	4.78E-8	5.00E-3	2.96E-7	3.10E-2	4.78E-8	2.00E-2	7.41E-8
	7440-43-9	Cadmium and compounds	9.45E-3	1.36E-7	2.59E-5	1.36E-7	5.60E-4	2.43E-4	5.00E-3	2.72E-5	1.40E-2	9.71E-6	3.70E-2	3.67E-6	6.70E-3	2.03E-5	3.70E-2	3.67E-6	3.00E-2	4.53E-6
	18540-29-9	Chromium VI, chromate, and dichromate particulate	1.20E-2	1.73E-7	3.29E-5	1.73E-7	3.10E-5	5.58E-3	8.30E-2	2.08E-6	5.20E-4	3.33E-4	8.80E-1	1.97E-7	1.00E-3	1.73E-4	8.80E-1	1.97E-7	3.00E-1	5.76E-7
	218-01-9	Chrysene	1.19E-5	1.72E-10	3.27E-8	1.72E-10	4.30E-4	3.99E-7			1.60E-2	1.07E-8			3.00E-2	5.72E-9				
	7440-48-4	Cobalt and compounds	7.21E-4	1.04E-8	1.98E-6	1.04E-8			1.00E-1	1.04E-7			4.40E-1	2.36E-8			4.40E-1	2.36E-8		
	7440-50-8	Copper and compounds	7.30E-3	1.05E-7	2.00E-5	1.05E-7													1.00E+2	1.05E-9
	53-70-3	Dibenz[a,h]anthracene	7.88E-6	1.13E-10	2.16E-8	1.13E-10	4.30E-6	2.63E-5			1.60E-4	7.08E-7			3.00E-4	3.78E-7				
	100-41-4	Ethyl benzene	8.16E-2	1.17E-6	2.24E-4	1.17E-6	4.00E-1	2.93E-6	2.60E+2	4.51E-9	1.00E+1	1.17E-7	1.10E+3	1.07E-9	4.80E+0	2.44E-7	1.10E+3	1.07E-9	2.20E+4	5.33E-11
	206-44-0	Fluoranthene	1.02E-4	1.47E-9	2.80E-7	1.47E-9	5.30E-4	2.77E-6			2.00E-2	7.35E-8			3.80E-2	3.87E-8				
	86-73-7	Fluorene	3.94E-5	5.67E-10	1.08E-7	5.67E-10														
	50-00-0	Formaldehyde	6.36E-1	9.15E-6	1.74E-3	9.15E-6	1.70E-1	5.38E-5	9.00E+0	1.02E-6	4.30E+0	2.13E-6	4.00E+1	2.29E-7	2.00E+0	4.57E-6	4.00E+1	2.29E-7	4.90E+1	1.87E-7
	110-54-3	Hexane	1.55E+1	2.22E-4	4.24E-2	2.22E-4			7.00E+2	3.18E-7			3.10E+3	7.17E-8			3.10E+3	7.17E-8		
	193-39-5	Indeno[1,2,3-cd]pyrene	1.00E-5	1.45E-10	2.75E-8	1.45E-10	6.10E-4	2.37E-7			2.20E-2	6.57E-9			4.30E-2	3.36E-9				
	7439-96-5	Manganese and compounds	3.26E-3	4.69E-8	8.94E-6	4.69E-8			9.00E-2	5.22E-7			4.00E-1	1.17E-7			4.00E-1	1.17E-7	3.00E-1	1.56E-7
	7439-97-6	Mercury and compounds	2.23E-3	3.21E-8	6.12E-6	3.21E-8			7.70E-2	4.17E-7			6.30E-1	5.10E-8			6.30E-1	5.10E-8	6.00E-1	5.35E-8
	91-20-3	Naphthalene	9.58E-3	1.38E-7	2.62E-5	1.38E-7	2.90E-2	4.75E-6	3.70E+0	3.72E-8	7.60E-1	1.81E-7	1.60E+1	8.61E-9	3.50E-1	3.94E-7	1.60E+1	8.61E-9	2.00E+2	6.89E-10
	C365	Nickel compounds, insoluble	1.80E-2	2.59E-7	4.94E-5	2.59E-7	3.80E-3	6.85E-5	1.40E-2	1.85E-5	1.00E-1	2.59E-6	6.20E-2	4.18E-6	4.60E-2	5.64E-6	6.20E-2	4.18E-6	2.00E-1	1.30E-6
	106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)	1.03E-2	1.48E-7	2.82E-5	1.48E-7	9.10E-2	1.63E-6	6.00E+1	2.47E-9	2.40E+0	6.18E-8	2.60E+2	5.70E-10	1.10E+0	1.35E-7	2.60E+2	5.70E-10	1.20E+4	1.24E-11
	85-01-8	Phenanthrene	2.89E-4	4.16E-9	7.93E-7	4.16E-9														
	115-07-1	Propylene	2.02E+0	2.90E-5	5.52E-3	2.90E-5			3.00E+3	9.67E-9			1.30E+4	2.23E-9			1.30E+4	2.23E-9		
	129-00-0	Pyrene	4.81E-5	6.92E-10	1.32E-7	6.92E-10														
	7782-49-2	Selenium and compounds	2.06E-4	2.96E-9	5.65E-7	2.96E-9													2.00E+0	1.48E-9
	108-88-3	Toluene	3.14E-1	4.52E-6	8.61E-4	4.52E-6			5.00E+3	9.04E-10			2.20E+4	2.06E-10			2.20E+4	2.06E-10	7.50E+3	6.03E-10
	7440-62-2	Vanadium (fume or dust)	1.98E-2	2.84E-7	5.41E-5	2.84E-7			1.00E-1	2.84E-6			4.40E-1	6.46E-7			4.40E-1	6.46E-7	8.00E-1	3.55E-7
	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xyl	2.34E-1	3.36E-6	6.40E-4	3.36E-6			2.20E+2	1.53E-8			9.70E+2	3.46E-9			9.70E+2	3.46E-9	8.70E+3	3.86E-10
	7440-66-6	Zinc and compounds	2.49E-1	3.58E-6	6.82E-4	3.58E-6														
		Total REER						**7.04E-3**		**2.05E-4**		**3.68E-4**		**2.11E-5**		**2.46E-4**		**2.11E-5**		**9.41E-6**

TEU	CAS	TAC	Emissions				Residential				Non-Residential Child				Non-Residential Worker				Acute	
			Annual		Daily		Cancer		Noncancer		Cancer		Noncancer		Cancer		Noncancer			
			lb/yr	g/s	lb/day	g/s	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)
HL	91-57-6	2-Methyl naphthalene	2.06E-4	2.96E-9	5.65E-7	2.96E-9														
	56-49-5	3-Methylcholanthrene	1.55E-5	2.22E-10	4.24E-8	2.22E-10														
	57-97-6	7,12-Dimethylbenz[a]anthracene	1.37E-4	1.98E-9	3.76E-7	1.98E-9														
	83-32-9	Acenaphthene	1.19E-5	1.72E-10	3.27E-8	1.72E-10														
	208-96-8	Acenaphthylene	1.04E-4	1.49E-9	2.85E-7	1.49E-9														
	75-07-0	Acetaldehyde	1.20E-1	1.73E-6	3.29E-4	1.73E-6	4.50E-1	3.84E-6	1.40E+2	1.23E-8	1.20E+1	1.44E-7	6.20E+2	2.78E-9	5.50E+0	3.14E-7	6.20E+2	2.78E-9	4.70E+2	3.67E-9
	107-02-8	Acrolein	4.16E-2	5.98E-7	1.14E-4	5.98E-7			3.50E-1	1.71E-6			1.50E+0	3.99E-7			1.50E+0	3.99E-7	6.90E+0	8.66E-8
	7664-41-7	Ammonia	1.55E+2	2.22E-3	4.24E-1	2.22E-3			5.00E+2	4.45E-6			2.20E+3	1.01E-6			2.20E+3	1.01E-6	1.20E+3	1.85E-6
	120-12-7	Anthracene	1.38E-5	1.99E-10	3.79E-8	1.99E-10														
	7440-38-2	Arsenic and compounds	1.72E-3	2.47E-8	4.71E-6	2.47E-8	2.40E-5	1.03E-3	1.70E-4	1.45E-4	1.30E-3	1.90E-5	2.40E-3	1.03E-5	6.20E-4	3.98E-5	2.40E-3	1.03E-5	2.00E-1	1.24E-7
	7440-39-3	Barium and compounds	3.78E-2	5.44E-7	1.04E-4	5.44E-7														
	56-55-3	Benz[a]anthracene	1.68E-5	2.42E-10	4.61E-8	2.42E-10	2.10E-4	1.15E-6			7.80E-3	3.10E-8			1.50E-2	1.61E-8				
	71-43-2	Benzene	9.59E-2	1.38E-6	2.63E-4	1.38E-6	1.30E-1	1.06E-5	3.00E+0	4.60E-7	3.30E+0	4.18E-7	1.30E+1	1.06E-7	1.50E+0	9.20E-7	1.30E+1	1.06E-7	2.90E+1	4.76E-8
	50-32-8	Benzo[a]pyrene	8.42E-6	1.21E-10	2.31E-8	1.21E-10	4.30E-5	2.82E-6	2.00E-3	6.05E-8	1.60E-3	7.57E-8	8.80E-3	1.38E-8	3.00E-3	4.04E-8	8.80E-3	1.38E-8	2.00E-3	6.05E-8
	205-99-2	Benzo[b]fluoranthene	9.79E-6	1.41E-10	2.68E-8	1.41E-10	5.30E-5	2.66E-6			2.00E-3	7.04E-8			3.80E-3	3.71E-8				
	191-24-2	Benzo[g,h,i]perylene	1.07E-5	1.54E-10	2.94E-8	1.54E-10	4.70E-3	3.29E-8			1.70E-1	9.08E-10			3.40E-1	4.54E-10				
	207-08-9	Benzo[k]fluoranthene	8.50E-6	1.22E-10	2.33E-8	1.22E-10	1.40E-3	8.74E-8			5.20E-2	2.35E-9			1.00E-1	1.22E-9				
	7440-41-7	Beryllium and compounds	1.03E-4	1.48E-9	2.82E-7	1.48E-9	4.20E-4	3.53E-6	7.00E-3	2.12E-7	1.10E-2	1.35E-7	3.10E-2	4.78E-8	5.00E-3	2.96E-7	3.10E-2	4.78E-8	2.00E-2	7.41E-8
	7440-43-9	Cadmium and compounds	9.45E-3	1.36E-7	2.59E-5	1.36E-7	5.60E-4	2.43E-4	5.00E-3	2.72E-5	1.40E-2	9.71E-6	3.70E-2	3.67E-6	6.70E-3	2.03E-5	3.70E-2	3.67E-6	3.00E-2	4.53E-6
	18540-29-9	Chromium VI, chromate, and dichromate particulate	1.20E-2	1.73E-7	3.29E-5	1.73E-7	3.10E-5	5.58E-3	8.30E-2	2.08E-6	5.20E-4	3.33E-4	8.80E-1	1.97E-7	1.00E-3	1.73E-4	8.80E-1	1.97E-7	3.00E-1	5.76E-7
	218-01-9	Chrysene	1.19E-5	1.72E-10	3.27E-8	1.72E-10	4.30E-4	3.99E-7			1.60E-2	1.07E-8			3.00E-2	5.72E-9				
	7440-48-4	Cobalt and compounds	7.21E-4	1.04E-8	1.98E-6	1.04E-8			1.00E-1	1.04E-7			4.40E-1	2.36E-8			4.40E-1	2.36E-8		
	7440-50-8	Copper and compounds	7.30E-3	1.05E-7	2.00E-5	1.05E-7													1.00E+2	1.05E-9
	53-70-3	Dibenz[a,h]anthracene	7.88E-6	1.13E-10	2.16E-8	1.13E-10	4.30E-6	2.63E-5			1.60E-4	7.08E-7			3.00E-4	3.78E-7				
	100-41-4	Ethyl benzene	8.16E-2	1.17E-6	2.24E-4	1.17E-6	4.00E-1	2.93E-6	2.60E+2	4.51E-9	1.00E+1	1.17E-7	1.10E+3	1.07E-9	4.80E+0	2.44E-7	1.10E+3	1.07E-9	2.20E+4	5.33E-11
	206-44-0	Fluoranthene	1.02E-4	1.47E-9	2.80E-7	1.47E-9	5.30E-4	2.77E-6			2.00E-2	7.35E-8			3.80E-2	3.87E-8				
	86-73-7	Fluorene	3.94E-5	5.67E-10	1.08E-7	5.67E-10														
	50-00-0	Formaldehyde	6.36E-1	9.15E-6	1.74E-3	9.15E-6	1.70E-1	5.38E-5	9.00E+0	1.02E-6	4.30E+0	2.13E-6	4.00E+1	2.29E-7	2.00E+0	4.57E-6	4.00E+1	2.29E-7	4.90E+1	1.87E-7
	110-54-3	Hexane	1.55E+1	2.22E-4	4.24E-2	2.22E-4			7.00E+2	3.18E-7			3.10E+3	7.17E-8			3.10E+3	7.17E-8		
	193-39-5	Indeno[1,2,3-cd]pyrene	1.00E-5	1.45E-10	2.75E-8	1.45E-10	6.10E-4	2.37E-7			2.20E-2	6.57E-9			4.30E-2	3.36E-9				
	7439-96-5	Manganese and compounds	3.26E-3	4.69E-8	8.94E-6	4.69E-8			9.00E-2	5.22E-7			4.00E-1	1.17E-7			4.00E-1	1.17E-7	3.00E-1	1.56E-7
	7439-97-6	Mercury and compounds	2.23E-3	3.21E-8	6.12E-6	3.21E-8			7.70E-2	4.17E-7			6.30E-1	5.10E-8			6.30E-1	5.10E-8	6.00E-1	5.35E-8
	91-20-3	Naphthalene	9.58E-3	1.38E-7	2.62E-5	1.38E-7	2.90E-2	4.75E-6	3.70E+0	3.72E-8	7.60E-1	1.81E-7	1.60E+1	8.61E-9	3.50E-1	3.94E-7	1.60E+1	8.61E-9	2.00E+2	6.89E-10
	C365	Nickel compounds, insoluble	1.80E-2	2.59E-7	4.94E-5	2.59E-7	3.80E-3	6.83E-5	1.40E-2	1.85E-5	1.00E-1	2.59E-6	6.20E-2	4.18E-6	4.60E-2	5.64E-6	6.20E-2	4.18E-6	2.00E-1	1.30E-6
	106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)	1.03E-2	1.48E-7	2.82E-5	1.48E-7	9.10E-2	1.63E-6	6.00E+1	2.47E-9	2.40E+0	6.18E-8	2.60E+2	5.70E-10	1.10E+0	1.35E-7	2.60E+2	5.70E-10	1.20E+4	1.24E-11
	85-01-8	Phenanthrene	2.89E-4	4.16E-9	7.93E-7	4.16E-9														
	115-07-1	Propylene	2.02E+0	2.90E-5	5.52E-3	2.90E-5			3.00E+3	9.67E-9			1.30E+4	2.23E-9			1.30E+4	2.23E-9		
	129-00-0	Pyrene	4.81E-5	6.92E-10	1.32E-7	6.92E-10														
	7782-49-2	Selenium and compounds	2.06E-4	2.96E-9	5.65E-7	2.96E-9													2.00E+0	1.48E-9
	108-88-3	Toluene	3.14E-1	4.52E-6	8.61E-4	4.52E-6			5.00E+3	9.04E-10			2.20E+4	2.06E-10			2.20E+4	2.06E-10	7.50E+3	6.03E-10
	7440-62-2	Vanadium (fume or dust)	1.98E-2	2.84E-7	5.41E-5	2.84E-7			1.00E-1	2.84E-6			4.40E-1	6.46E-7			4.40E-1	6.46E-7	8.00E-1	3.55E-7
	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xyl	2.34E-1	3.36E-6	6.40E-4	3.36E-6			2.20E+2	1.53E-8			9.70E+2	3.46E-9			9.70E+2	3.46E-9	8.70E+3	3.86E-10
	7440-66-6	Zinc and compounds	2.49E-1	3.58E-6	6.82E-4	3.58E-6														
	Total REER							**7.04E-3**		**2.05E-4**		**3.68E-4**		**2.11E-5**		**2.46E-4**		**2.11E-5**		**9.41E-6**

TEU	CAS	TAC	Emissions				Residential				Non-Residential Child				Non-Residential Worker				Acute	
			Annual		Daily		Cancer		Noncancer		Cancer		Noncancer		Cancer		Noncancer			
			lb/yr	g/s	lb/day	g/s	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)
HWW	91-57-6	2-Methyl naphthalene	2.06E-4	2.96E-9	5.65E-7	2.96E-9														
	56-49-5	3-Methylcholanthrene	1.55E-5	2.22E-10	4.24E-8	2.22E-10														
	57-97-6	7,12-Dimethylbenz[a]anthracene	1.37E-4	1.98E-9	3.76E-7	1.98E-9														
	83-32-9	Acenaphthene	1.19E-5	1.72E-10	3.27E-8	1.72E-10														
	208-96-8	Acenaphthylene	1.04E-4	1.49E-9	2.85E-7	1.49E-9														
	75-07-0	Acetaldehyde	1.20E-1	1.73E-6	3.29E-4	1.73E-6	4.50E-1	3.84E-6	1.40E+2	1.23E-8	1.20E+1	1.44E-7	6.20E+2	2.78E-9	5.50E+0	3.14E-7	6.20E+2	2.78E-9	4.70E+2	3.67E-9
	107-02-8	Acrolein	4.16E-2	5.98E-7	1.14E-4	5.98E-7			3.50E-1	1.71E-6			1.50E+0	3.99E-7			1.50E+0	3.99E-7	6.90E+0	8.66E-8
	7664-41-7	Ammonia	1.55E+2	2.22E-3	4.24E-1	2.22E-3			5.00E+2	4.45E-6			2.20E+3	1.01E-6			2.20E+3	1.01E-6	1.20E+3	1.85E-6
	120-12-7	Anthracene	1.38E-5	1.99E-10	3.79E-8	1.99E-10														
	7440-38-2	Arsenic and compounds	1.72E-3	2.47E-8	4.71E-6	2.47E-8	2.40E-5	1.03E-3	1.70E-4	1.45E-4	1.30E-3	1.90E-5	2.40E-3	1.03E-5	6.20E-4	3.98E-5	2.40E-3	1.03E-5	2.00E-1	1.24E-7
	7440-39-3	Barium and compounds	3.78E-2	5.44E-7	1.04E-4	5.44E-7														
	56-55-3	Benz[a]anthracene	1.68E-5	2.42E-10	4.61E-8	2.42E-10	2.10E-4	1.15E-6			7.80E-3	3.10E-8			1.50E-2	1.61E-8				
	71-43-2	Benzene	9.59E-2	1.38E-6	2.63E-4	1.38E-6	1.30E-1	1.06E-5	3.00E+0	4.60E-7	3.30E+0	4.18E-7	1.30E+1	1.06E-7	1.50E+0	9.20E-7	1.30E+1	1.06E-7	2.90E+1	4.76E-8
	50-32-8	Benzo[a]pyrene	8.42E-6	1.21E-10	2.31E-8	1.21E-10	4.30E-5	2.82E-6	2.00E-3	6.05E-8	1.60E-3	7.57E-8	8.80E-3	1.38E-8	3.00E-3	4.04E-8	8.80E-3	1.38E-8	2.00E-3	6.05E-8
	205-99-2	Benzo[b]fluoranthene	9.79E-6	1.41E-10	2.68E-8	1.41E-10	5.30E-5	2.66E-6			2.00E-3	7.04E-8			3.80E-3	3.71E-8				
	191-24-2	Benzo[g,h,i]perylene	1.07E-5	1.54E-10	2.94E-8	1.54E-10	4.70E-3	3.29E-8			1.70E-1	9.08E-10			3.40E-1	4.54E-10				
	207-08-9	Benzo[k]fluoranthene	8.50E-6	1.22E-10	2.33E-8	1.22E-10	1.40E-3	8.74E-8			5.20E-2	2.35E-9			1.00E-1	1.22E-9				
	7440-41-7	Beryllium and compounds	1.03E-4	1.48E-9	2.82E-7	1.48E-9	4.20E-4	3.53E-6	7.00E-3	2.12E-7	1.10E-2	1.35E-7	3.10E-2	4.78E-8	5.00E-3	2.96E-7	3.10E-2	4.78E-8	2.00E-2	7.41E-8
	7440-43-9	Cadmium and compounds	9.45E-3	1.36E-7	2.59E-5	1.36E-7	5.60E-4	2.43E-4	5.00E-3	2.72E-5	1.40E-2	9.71E-6	3.70E-2	3.67E-6	6.70E-3	2.03E-5	3.70E-2	3.67E-6	3.00E-2	4.53E-6
	18540-29-9	Chromium VI, chromate, and dichromate particulate	1.20E-2	1.73E-7	3.29E-5	1.73E-7	3.10E-5	5.58E-3	8.30E-2	2.08E-6	5.20E-4	3.33E-4	8.80E-1	1.97E-7	1.00E-3	1.73E-4	8.80E-1	1.97E-7	3.00E-1	5.76E-7
	218-01-9	Chrysene	1.19E-5	1.72E-10	3.27E-8	1.72E-10	4.30E-4	3.99E-7			1.60E-2	1.07E-8			3.00E-2	5.72E-9				
	7440-48-4	Cobalt and compounds	7.21E-4	1.04E-8	1.98E-6	1.04E-8			1.00E-1	1.04E-7			4.40E-1	2.36E-8			4.40E-1	2.36E-8		
	7440-50-8	Copper and compounds	7.30E-3	1.05E-7	2.00E-5	1.05E-7													1.00E+2	1.05E-9
	53-70-3	Dibenz[a,h]anthracene	7.88E-6	1.13E-10	2.16E-8	1.13E-10	4.30E-6	2.63E-5			1.60E-4	7.08E-7			3.00E-4	3.78E-7				
	100-41-4	Ethyl benzene	8.16E-2	1.17E-6	2.24E-4	1.17E-6	4.00E-1	2.93E-6	2.60E+2	4.51E-9	1.00E+1	1.17E-7	1.10E+3	1.07E-9	4.80E+0	2.44E-7	1.10E+3	1.07E-9	2.20E+4	5.33E-11
	206-44-0	Fluoranthene	1.02E-4	1.47E-9	2.80E-7	1.47E-9	5.30E-4	2.77E-6			2.00E-2	7.35E-8			3.80E-2	3.87E-8				
	86-73-7	Fluorene	3.94E-5	5.67E-10	1.08E-7	5.67E-10														
	50-00-0	Formaldehyde	6.36E-1	9.15E-6	1.74E-3	9.15E-6	1.70E-1	5.38E-5	9.00E+0	1.02E-6	4.30E+0	2.13E-6	4.00E+1	2.29E-7	2.00E+0	4.57E-6	4.00E+1	2.29E-7	4.90E+1	1.87E-7
	110-54-3	Hexane	1.55E+1	2.22E-4	4.24E-2	2.22E-4			7.00E+2	3.18E-7			3.10E+3	7.17E-8			3.10E+3	7.17E-8		
	193-39-5	Indeno[1,2,3-cd]pyrene	1.00E-5	1.45E-10	2.75E-8	1.45E-10	6.10E-4	2.37E-7			2.20E-2	6.57E-9			4.30E-2	3.36E-9				
	7439-96-5	Manganese and compounds	3.26E-3	4.69E-8	8.94E-6	4.69E-8			9.00E-2	5.22E-7			4.00E-1	1.17E-7			4.00E-1	1.17E-7	3.00E-1	1.56E-7
	7439-97-6	Mercury and compounds	2.23E-3	3.21E-8	6.12E-6	3.21E-8			7.70E-2	4.17E-7			6.30E-1	5.10E-8			6.30E-1	5.10E-8	6.00E-1	5.35E-8
	91-20-3	Naphthalene	9.58E-3	1.38E-7	2.62E-5	1.38E-7	2.90E-2	4.75E-6	3.70E+0	3.72E-8	7.60E-1	1.81E-7	1.60E+1	8.61E-9	3.50E-1	3.94E-7	1.60E+1	8.61E-9	2.00E+2	6.89E-10
	C365	Nickel compounds, insoluble	1.80E-2	2.59E-7	4.94E-5	2.59E-7	3.80E-3	6.85E-5	1.40E-2	1.85E-5	1.00E-1	2.59E-6	6.20E-2	4.18E-6	4.60E-2	5.64E-6	6.20E-2	4.18E-6	2.00E-1	1.30E-6
	106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)	1.03E-2	1.48E-7	2.82E-5	1.48E-7	9.10E-2	1.63E-6	6.00E+1	2.47E-9	2.40E+0	6.18E-8	2.60E+2	5.70E-10	1.10E+0	1.35E-7	2.60E+2	5.70E-10	1.20E+4	1.24E-11
	85-01-8	Phenanthrene	2.89E-4	4.16E-9	7.93E-7	4.16E-9														
	115-07-1	Propylene	2.02E+0	2.90E-5	5.52E-3	2.90E-5			3.00E+3	9.67E-9			1.30E+4	2.23E-9			1.30E+4	2.23E-9		
	129-00-0	Pyrene	4.81E-5	6.92E-10	1.32E-7	6.92E-10														
	7782-49-2	Selenium and compounds	2.06E-4	2.96E-9	5.65E-7	2.96E-9													2.00E+0	1.48E-9
	108-88-3	Toluene	3.14E-1	4.52E-6	8.61E-4	4.52E-6			5.00E+3	9.04E-10			2.20E+4	2.06E-10			2.20E+4	2.06E-10	7.50E+3	6.03E-10
	7440-62-2	Vanadium (fume or dust)	1.98E-2	2.84E-7	5.41E-5	2.84E-7			1.00E-1	2.84E-6			4.40E-1	6.46E-7			4.40E-1	6.46E-7	8.00E-1	3.55E-7
	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xyl	2.34E-1	3.36E-6	6.40E-4	3.36E-6			2.20E+2	1.53E-8			9.70E+2	3.46E-9			9.70E+2	3.46E-9	8.70E+3	3.86E-10
	7440-66-6	Zinc and compounds	2.49E-1	3.58E-6	6.82E-4	3.58E-6														
		Total REER						**7.04E-3**		**2.05E-4**		**3.68E-4**		**2.11E-5**		**2.46E-4**		**2.11E-5**		**9.41E-6**

TEU	CAS	TAC	Emissions				Residential				Non-Residential Child				Non-Residential Worker				Acute	
			Annual		Daily		Cancer		Noncancer		Cancer		Noncancer		Cancer		Noncancer			
			lb/yr	g/s	lb/day	g/s	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)
HTW	91-57-6	2-Methyl naphthalene	4.12E-4	5.93E-9	1.13E-6	5.93E-9														
	56-49-5	3-Methylcholanthrene	3.09E-5	4.45E-10	8.47E-8	4.45E-10														
	57-97-6	7,12-Dimethylbenz[a]anthracene	2.75E-4	3.95E-9	7.53E-7	3.95E-9														
	83-32-9	Acenaphthene	2.39E-5	3.43E-10	6.54E-8	3.43E-10														
	208-96-8	Acenaphthylene	2.08E-4	2.99E-9	5.69E-7	2.99E-9														
	75-07-0	Acetaldehyde	2.40E-1	3.45E-6	6.58E-4	3.45E-6	4.50E-1	7.67E-6	1.40E+2	2.47E-8	1.20E+1	2.88E-7	6.20E+2	5.57E-9	5.50E+0	6.28E-7	6.20E+2	5.57E-9	4.70E+2	7.34E-9
	107-02-8	Acrolein	8.31E-2	1.20E-6	2.28E-4	1.20E-6			3.50E-1	3.42E-6			1.50E+0	7.97E-7			1.50E+0	7.97E-7	6.90E+0	1.73E-7
	7664-41-7	Ammonia	3.09E+2	4.45E-3	8.47E-1	4.45E-3			5.00E+2	8.89E-6			2.20E+3	2.02E-6			2.20E+3	2.02E-6	1.20E+3	3.71E-6
	120-12-7	Anthracene	2.77E-5	3.98E-10	7.58E-8	3.98E-10														
	7440-38-2	Arsenic and compounds	3.44E-3	4.94E-8	9.41E-6	4.94E-8	2.40E-5	2.06E-3	1.70E-4	2.91E-4	1.30E-3	3.80E-5	2.40E-3	2.06E-5	6.20E-4	7.97E-5	2.40E-3	2.06E-5	2.00E-1	2.47E-7
	7440-39-3	Barium and compounds	7.56E-2	1.09E-6	2.07E-4	1.09E-6														
	56-55-3	Benz[a]anthracene	3.37E-5	4.84E-10	9.22E-8	4.84E-10	2.10E-4	2.31E-6			7.80E-3	6.21E-8			1.50E-2	3.23E-8				
	71-43-2	Benzene	1.92E-1	2.76E-6	5.26E-4	2.76E-6	1.30E-1	2.12E-5	3.00E+0	9.20E-7	3.30E+0	8.36E-7	1.30E+1	2.12E-7	1.50E+0	1.84E-6	1.30E+1	2.12E-7	2.90E+1	9.52E-8
	50-32-8	Benzo[a]pyrene	1.68E-5	2.42E-10	4.61E-8	2.42E-10	4.30E-5	5.63E-6	2.00E-3	1.21E-7	1.60E-3	1.51E-7	8.80E-3	2.75E-8	3.00E-3	8.07E-8	8.80E-3	2.75E-8	2.00E-3	1.21E-7
	205-99-2	Benzo[b]fluoranthene	1.96E-5	2.82E-10	5.36E-8	2.82E-10	5.30E-5	5.31E-6			2.00E-3	1.41E-7			3.80E-3	7.41E-8				
	191-24-2	Benzo[g,h,i]perylene	2.15E-5	3.09E-10	5.88E-8	3.09E-10	4.70E-3	6.57E-8			1.70E-1	1.82E-9			3.40E-1	9.08E-10				
	207-08-9	Benzo[k]fluoranthene	1.70E-5	2.45E-10	4.66E-8	2.45E-10	1.40E-3	1.75E-7			5.20E-2	4.70E-9			1.00E-1	2.45E-9				
	7440-41-7	Beryllium and compounds	2.06E-4	2.96E-9	5.65E-7	2.96E-9	4.20E-4	7.06E-6	7.00E-3	4.24E-7	1.10E-2	2.70E-7	3.10E-2	9.56E-8	5.00E-3	5.93E-7	3.10E-2	9.56E-8	2.00E-2	1.48E-7
	7440-43-9	Cadmium and compounds	1.89E-2	2.72E-7	5.18E-5	2.72E-7	5.60E-4	4.85E-4	5.00E-3	5.44E-5	1.40E-2	1.94E-5	3.70E-2	7.34E-6	6.70E-3	4.06E-5	3.70E-2	7.34E-6	3.00E-2	9.06E-6
	18540-29-9	Chromium VI, chromate, and dichromate particulate	2.40E-2	3.46E-7	6.59E-5	3.46E-7	3.10E-5	1.12E-2	8.30E-2	4.17E-6	5.20E-4	6.65E-4	8.80E-1	3.93E-7	1.00E-3	3.46E-4	8.80E-1	3.93E-7	3.00E-1	1.15E-6
	218-01-9	Chrysene	2.39E-5	3.43E-10	6.54E-8	3.43E-10	4.30E-4	7.99E-7			1.60E-2	2.15E-8			3.00E-2	1.14E-8				
	7440-48-4	Cobalt and compounds	1.44E-3	2.08E-8	3.95E-6	2.08E-8			1.00E-1	2.08E-7			4.40E-1	4.72E-8			4.40E-1	4.72E-8		
	7440-50-8	Copper and compounds	1.46E-2	2.10E-7	4.00E-5	2.10E-7													1.00E+2	2.10E-9
	53-70-3	Dibenz[a,h]anthracene	1.58E-5	2.27E-10	4.32E-8	2.27E-10	4.30E-6	5.27E-5			1.60E-4	1.42E-6			3.00E-4	7.55E-7				
	100-41-4	Ethyl benzene	1.63E-1	2.35E-6	4.47E-4	2.35E-6	4.00E-1	5.87E-6	2.60E+2	9.03E-9	1.00E+1	2.35E-7	1.10E+3	2.13E-9	4.80E+0	4.89E-7	1.10E+3	2.13E-9	2.20E+4	1.07E-10
	206-44-0	Fluoranthene	2.04E-4	2.94E-9	5.60E-7	2.94E-9	5.30E-4	5.55E-6			2.00E-2	1.47E-7			3.80E-2	7.74E-8				
	86-73-7	Fluorene	7.88E-5	1.13E-9	2.16E-7	1.13E-9														
	50-00-0	Formaldehyde	1.27E+0	1.83E-5	3.48E-3	1.83E-5	1.70E-1	1.08E-4	9.00E+0	2.03E-6	4.30E+0	4.25E-6	4.00E+1	4.57E-7	2.00E+0	9.15E-6	4.00E+1	4.57E-7	4.90E+1	3.73E-7
	110-54-3	Hexane	3.09E+1	4.45E-4	8.47E-2	4.45E-4			7.00E+2	6.35E-7			3.10E+3	1.43E-7			3.10E+3	1.43E-7		
	193-39-5	Indeno[1,2,3-cd]pyrene	2.01E-5	2.89E-10	5.51E-8	2.89E-10	6.10E-4	4.74E-7			2.20E-2	1.31E-8			4.30E-2	6.72E-9				
	7439-96-5	Manganese and compounds	6.53E-3	9.39E-8	1.79E-5	9.39E-8			9.00E-2	1.04E-6			4.00E-1	2.35E-7			4.00E-1	2.35E-7	3.00E-1	3.13E-7
	7439-97-6	Mercury and compounds	4.47E-3	6.42E-8	1.22E-5	6.42E-8			7.70E-2	8.34E-7			6.30E-1	1.02E-7			6.30E-1	1.02E-7	6.00E-1	1.07E-7
	91-20-3	Naphthalene	1.92E-2	2.75E-7	5.25E-5	2.75E-7	2.90E-2	9.50E-6	3.70E+0	7.45E-8	7.60E-1	3.62E-7	1.60E+1	1.72E-8	3.50E-1	7.87E-7	1.60E+1	1.72E-8	2.00E+2	1.38E-9
	C365	Nickel compounds, insoluble	3.61E-2	5.19E-7	9.88E-5	5.19E-7	3.80E-3	1.37E-4	1.40E-2	3.71E-5	1.00E-1	5.19E-6	6.20E-2	8.37E-6	4.60E-2	1.13E-5	6.20E-2	8.37E-6	2.00E-1	2.59E-6
	106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)	2.06E-2	2.96E-7	5.65E-5	2.96E-7	9.10E-2	3.26E-6	6.00E+1	4.94E-9	2.40E+0	1.24E-7	2.60E+2	1.14E-9	1.10E+0	2.70E-7	2.60E+2	1.14E-9	1.20E+4	2.47E-11
	85-01-8	Phenanthrene	5.79E-4	8.33E-9	1.59E-6	8.33E-9														
	115-07-1	Propylene	4.03E+0	5.80E-5	1.10E-2	5.80E-5			3.00E+3	1.93E-8			1.30E+4	4.46E-9			1.30E+4	4.46E-9		
	129-00-0	Pyrene	9.62E-5	1.38E-9	2.64E-7	1.38E-9														
	7782-49-2	Selenium and compounds	4.12E-4	5.93E-9	1.13E-6	5.93E-9													2.00E+0	2.96E-9
	108-88-3	Toluene	6.29E-1	9.04E-6	1.72E-3	9.04E-6			5.00E+3	1.81E-9			2.20E+4	4.11E-10			2.20E+4	4.11E-10	7.50E+3	1.21E-9
	7440-62-2	Vanadium (fume or dust)	3.95E-2	5.68E-7	1.08E-4	5.68E-7			1.00E-1	5.68E-6			4.40E-1	1.29E-6			4.40E-1	1.29E-6	8.00E-1	7.10E-7
	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xyl	4.67E-1	6.72E-6	1.28E-3	6.72E-6			2.20E+2	3.05E-8			9.70E+2	6.93E-9			9.70E+2	6.93E-9	8.70E+3	7.72E-10
	7440-66-6	Zinc and compounds	4.98E-1	7.16E-6	1.36E-3	7.16E-6														
		Total REER						**1.41E-2**		**4.11E-4**		**7.36E-4**		**4.22E-5**		**4.92E-4**		**4.22E-5**		**1.88E-5**

TEU	CAS	TAC	Emissions				Residential				Non-Residential Child				Non-Residential Worker				Acute	
			Annual		Daily		Cancer		Noncancer		Cancer		Noncancer		Cancer		Noncancer			
			lb/yr	g/s	lb/day	g/s	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)
HMO	91-57-6	2-Methyl naphthalene	2.06E-4	2.96E-9	5.65E-7	2.96E-9														
	56-49-5	3-Methylcholanthrene	1.55E-5	2.22E-10	4.24E-8	2.22E-10														
	57-97-6	7,12-Dimethylbenz[a]anthracene	1.37E-4	1.98E-9	3.76E-7	1.98E-9														
	83-32-9	Acenaphthene	1.19E-5	1.72E-10	3.27E-8	1.72E-10														
	208-96-8	Acenaphthylene	1.04E-4	1.49E-9	2.85E-7	1.49E-9														
	75-07-0	Acetaldehyde	1.20E-1	1.73E-6	3.29E-4	1.73E-6	4.50E-1	3.84E-6	1.40E+2	1.23E-8	1.20E+1	1.44E-7	6.20E+2	2.78E-9	5.50E+0	3.14E-7	6.20E+2	2.78E-9	4.70E+2	3.67E-9
	107-02-8	Acrolein	4.16E-2	5.98E-7	1.14E-4	5.98E-7			3.50E-1	1.71E-6			1.50E+0	3.99E-7			1.50E+0	3.99E-7	6.90E+0	8.66E-8
	7664-41-7	Ammonia	1.55E+2	2.22E-3	4.24E-1	2.22E-3			5.00E+2	4.45E-6			2.20E+3	1.01E-6			2.20E+3	1.01E-6	1.20E+3	1.85E-6
	120-12-7	Anthracene	1.38E-5	1.99E-10	3.79E-8	1.99E-10														
	7440-38-2	Arsenic and compounds	1.72E-3	2.47E-8	4.71E-6	2.47E-8	2.40E-5	1.03E-3	1.70E-4	1.45E-4	1.30E-3	1.90E-5	2.40E-3	1.03E-5	6.20E-4	3.98E-5	2.40E-3	1.03E-5	2.00E-1	1.24E-7
	7440-39-3	Barium and compounds	3.78E-2	5.44E-7	1.04E-4	5.44E-7														
	56-55-3	Benz[a]anthracene	1.68E-5	2.42E-10	4.61E-8	2.42E-10	2.10E-4	1.15E-6			7.80E-3	3.10E-8			1.50E-2	1.61E-8				
	71-43-2	Benzene	9.59E-2	1.38E-6	2.63E-4	1.38E-6	1.30E-1	1.06E-5	3.00E+0	4.60E-7	3.30E+0	4.18E-7	1.30E+1	1.06E-7	1.50E+0	9.20E-7	1.30E+1	1.06E-7	2.90E+1	4.76E-8
	50-32-8	Benzo[a]pyrene	8.42E-6	1.21E-10	2.31E-8	1.21E-10	4.30E-5	2.82E-6	2.00E-3	6.05E-8	1.60E-3	7.57E-8	8.80E-3	1.38E-8	3.00E-3	4.04E-8	8.80E-3	1.38E-8	2.00E-3	6.05E-8
	205-99-2	Benzo[b]fluoranthene	9.79E-6	1.41E-10	2.68E-8	1.41E-10	5.30E-5	2.66E-6			2.00E-3	7.04E-8			3.80E-3	3.71E-8				
	191-24-2	Benzo[g,h,i]perylene	1.07E-5	1.54E-10	2.94E-8	1.54E-10	4.70E-3	3.29E-8			1.70E-1	9.08E-10			3.40E-1	4.54E-10				
	207-08-9	Benzo[k]fluoranthene	8.50E-6	1.22E-10	2.33E-8	1.22E-10	1.40E-3	8.74E-8			5.20E-2	2.35E-9			1.00E-1	1.22E-9				
	7440-41-7	Beryllium and compounds	1.03E-4	1.48E-9	2.82E-7	1.48E-9	4.20E-4	3.53E-6	7.00E-3	2.12E-7	1.10E-2	1.35E-7	3.10E-2	4.78E-8	5.00E-3	2.96E-7	3.10E-2	4.78E-8	2.00E-2	7.41E-8
	7440-43-9	Cadmium and compounds	9.45E-3	1.36E-7	2.59E-5	1.36E-7	5.60E-4	2.43E-4	5.00E-3	2.72E-5	1.40E-2	9.71E-6	3.70E-2	3.67E-6	6.70E-3	2.03E-5	3.70E-2	3.67E-6	3.00E-2	4.53E-6
	18540-29-9	Chromium VI, chromate, and dichromate particulate	1.20E-2	1.73E-7	3.29E-5	1.73E-7	3.10E-5	5.58E-3	8.30E-2	2.08E-6	5.20E-4	3.33E-4	8.80E-1	1.97E-7	1.00E-3	1.73E-4	8.80E-1	1.97E-7	3.00E-1	5.76E-7
	218-01-9	Chrysene	1.19E-5	1.72E-10	3.27E-8	1.72E-10	4.30E-4	3.99E-7			1.60E-2	1.07E-8			3.00E-2	5.72E-9				
	7440-48-4	Cobalt and compounds	7.21E-4	1.04E-8	1.98E-6	1.04E-8			1.00E-1	1.04E-7			4.40E-1	2.36E-8			4.40E-1	2.36E-8		
	7440-50-8	Copper and compounds	7.30E-3	1.05E-7	2.00E-5	1.05E-7													1.00E+2	1.05E-9
	53-70-3	Dibenz[a,h]anthracene	7.88E-6	1.13E-10	2.16E-8	1.13E-10	4.30E-6	2.63E-5			1.60E-4	7.08E-7			3.00E-4	3.78E-7				
	100-41-4	Ethyl benzene	8.16E-2	1.17E-6	2.24E-4	1.17E-6	4.00E-1	2.93E-6	2.60E+2	4.51E-9	1.00E+1	1.17E-7	1.10E+3	1.07E-9	4.80E+0	2.44E-7	1.10E+3	1.07E-9	2.20E+4	5.33E-11
	206-44-0	Fluoranthene	1.02E-4	1.47E-9	2.80E-7	1.47E-9	5.30E-4	2.77E-6			2.00E-2	7.35E-8			3.80E-2	3.87E-8				
	86-73-7	Fluorene	3.94E-5	5.67E-10	1.08E-7	5.67E-10														
	50-00-0	Formaldehyde	6.36E-1	9.15E-6	1.74E-3	9.15E-6	1.70E-1	5.38E-5	9.00E+0	1.02E-6	4.30E+0	2.13E-6	4.00E+1	2.29E-7	2.00E+0	4.57E-6	4.00E+1	2.29E-7	4.90E+1	1.87E-7
	110-54-3	Hexane	1.55E+1	2.22E-4	4.24E-2	2.22E-4			7.00E+2	3.18E-7			3.10E+3	7.17E-8			3.10E+3	7.17E-8		
	193-39-5	Indeno[1,2,3-cd]pyrene	1.00E-5	1.45E-10	2.75E-8	1.45E-10	6.10E-4	2.37E-7			2.20E-2	6.57E-9			4.30E-2	3.36E-9				
	7439-96-5	Manganese and compounds	3.26E-3	4.69E-8	8.94E-6	4.69E-8			9.00E-2	5.22E-7			4.00E-1	1.17E-7			4.00E-1	1.17E-7	3.00E-1	1.56E-7
	7439-97-6	Mercury and compounds	2.23E-3	3.21E-8	6.12E-6	3.21E-8			7.70E-2	4.17E-7			6.30E-1	5.10E-8			6.30E-1	5.10E-8	6.00E-1	5.35E-8
	91-20-3	Naphthalene	9.58E-3	1.38E-7	2.62E-5	1.38E-7	2.90E-2	4.75E-6	3.70E+0	3.72E-8	7.60E-1	1.81E-7	1.60E+1	8.61E-9	3.50E-1	3.94E-7	1.60E+1	8.61E-9	2.00E+2	6.89E-10
	C365	Nickel compounds, insoluble	1.80E-2	2.59E-7	4.94E-5	2.59E-7	3.80E-3	6.85E-5	1.40E-2	1.85E-5	1.00E-1	2.59E-6	6.20E-2	4.18E-6	4.60E-2	5.64E-6	6.20E-2	4.18E-6	2.00E-1	1.30E-6
	106-46-7	p-Dichlorobenzene (1,4-Dichlorobenzene)	1.03E-2	1.48E-7	2.82E-5	1.48E-7	9.10E-2	1.63E-6	6.00E+1	2.47E-9	2.40E+0	6.18E-8	2.60E+2	5.70E-10	1.10E+0	1.35E-7	2.60E+2	5.70E-10	1.20E+4	1.24E-11
	85-01-8	Phenanthrene	2.89E-4	4.16E-9	7.93E-7	4.16E-9														
	115-07-1	Propylene	2.02E+0	2.90E-5	5.52E-3	2.90E-5			3.00E+3	9.67E-9			1.30E+4	2.23E-9			1.30E+4	2.23E-9		
	129-00-0	Pyrene	4.81E-5	6.92E-10	1.32E-7	6.92E-10														
	7782-49-2	Selenium and compounds	2.06E-4	2.96E-9	5.65E-7	2.96E-9													2.00E+0	1.48E-9
	108-88-3	Toluene	3.14E-1	4.52E-6	8.61E-4	4.52E-6			5.00E+3	9.04E-10			2.20E+4	2.06E-10			2.20E+4	2.06E-10	7.50E+3	6.03E-10
	7440-62-2	Vanadium (fume or dust)	1.98E-2	2.84E-7	5.41E-5	2.84E-7			1.00E-1	2.84E-6			4.40E-1	6.46E-7			4.40E-1	6.46E-7	8.00E-1	3.55E-7
	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xyl	2.34E-1	3.36E-6	6.40E-4	3.36E-6			2.20E+2	1.53E-8			9.70E+2	3.46E-9			9.70E+2	3.46E-9	8.70E+3	3.86E-10
	7440-66-6	Zinc and compounds	2.49E-1	3.58E-6	6.82E-4	3.58E-6														
		Total REER						**7.04E-3**		**2.05E-4**		**3.68E-4**		**2.11E-5**		**2.46E-4**		**2.11E-5**		**9.41E-6**
CKD	7440-38-2	Arsenic and compounds	8.11E-2	1.17E-6	2.22E-4	1.17E-6	2.40E-5	4.86E-2	1.70E-4	6.86E-3	1.30E-3	8.97E-4	2.40E-3	4.86E-4	6.20E-4	1.88E-3	2.40E-3	4.86E-4	2.00E-1	5.83E-6
	7440-41-7	Beryllium and compounds	5.73E-4	8.24E-9	1.57E-6	8.24E-9	4.20E-4	1.96E-5	7.00E-3	1.18E-6	1.10E-2	7.49E-7	3.10E-2	2.66E-7	5.00E-3	1.65E-6	3.10E-2	2.66E-7	2.00E-2	4.12E-7
	7440-43-9	Cadmium and compounds	1.05E-4	1.51E-9	2.88E-7	1.51E-9	5.60E-4	2.70E-6	5.00E-3	3.02E-7	1.40E-2	1.08E-7	3.70E-2	4.09E-8	6.70E-3	2.26E-7	3.70E-2	4.09E-8	3.00E-2	5.04E-8
	7440-48-4	Cobalt and compounds	7.46E-4	1.07E-8	2.04E-6	1.07E-8			1.00E-1	1.07E-7			4.40E-1	2.44E-8			4.40E-1	2.44E-8		
	18540-29-9	Chromium VI, chromate, and dichromate particulate	1.46E-2	2.11E-7	4.01E-5	2.11E-7	3.10E-5	6.80E-3	8.30E-2	2.54E-6	5.20E-4	4.05E-4	8.80E-1	2.39E-7	1.00E-3	2.11E-4	8.80E-1	2.39E-7	3.00E-1	7.02E-7
	7439-96-5	Manganese and compounds	3.99E-2	5.73E-7	1.09E-4	5.73E-7			9.00E-2	6.37E-6			4.00E-1	1.43E-6			4.00E-1	1.43E-6	3.00E-1	1.91E-6
	C365	Nickel compounds, insoluble	2.43E-3	3.49E-8	6.65E-6	3.49E-8	3.80E-3	9.19E-6	1.40E-2	2.49E-6	1.00E-1	3.49E-7	6.20E-2	5.63E-7	4.60E-2	7.59E-7	6.20E-2	5.63E-7	2.00E-1	1.75E-7
	7439-92-1	Lead and compounds	3.39E-3	4.88E-8	9.29E-6	4.88E-8			1.50E-1	3.25E-7			6.60E-1	7.39E-8			6.60E-1	7.39E-8	1.50E-1	3.25E-7
	7440-36-0	Antimony and compounds	2.18E-2	3.13E-7	5.97E-5	3.13E-7			3.00E-1	1.04E-6			1.30E+0	2.41E-7			1.30E+0	2.41E-7	1.00E+0	3.13E-7
	7440-39-3	Barium and compounds	3.48E-1	5.00E-6	9.52E-4	5.00E-6														
	7440-50-8	Copper and compounds	9.36E-3	1.35E-7	2.56E-5	1.35E-7													1.00E+2	1.35E-9
	1313-27-5	Molybdenum trioxide	4.62E-3	6.65E-8	1.27E-5	6.65E-8														
	7440-62-2	Vanadium (fume or dust)	8.44E-3	1.21E-7	2.31E-5	1.21E-7			1.00E-1	1.21E-6			4.40E-1	2.76E-7			4.40E-1	2.76E-7	8.00E-1	1.52E-7
	7440-66-6	Zinc and compounds	8.64E-3	1.24E-7	2.37E-5	1.24E-7														
	7439-97-6	Mercury and compounds	2.08E+0	2.99E-5	1.25E-2	6.54E-5			7.70E-2	3.88E-4			6.30E-1	4.74E-5			6.30E-1	4.74E-5	6.00E-1	1.09E-4
	7440-22-4	Silver and compounds	4.91E-3	7.06E-8	1.34E-5	7.06E-8														
	7631-86-9	Silica, crystalline (respirable)	3.34E+2	4.81E-3	9.16E-1	4.81E-3			3.00E+0	1.60E-3			1.30E+1	3.70E-4			1.30E+1	3.70E-4		
		Total REER						**5.54E-2**		**8.86E-3**		**1.30E-3**		**9.06E-4**		**2.09E-3**		**9.06E-4**		**1.19E-4**

TEU	CAS	TAC	Emissions				Residential				Non-Residential Child				Non-Residential Worker				Acute	
			Annual		Daily		Cancer		Noncancer		Cancer		Noncancer		Cancer		Noncancer			
			lb/yr	g/s	lb/day	g/s	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)
EW	7439-97-6	Mercury and compounds	5.05E+0	7.27E-5	3.03E-2	1.59E-4			7.70E-2	9.44E-4			6.30E-1	1.15E-4			6.30E-1	1.15E-4	6.00E-1	2.65E-4
	74-90-8	Cyanide, Hydrogen	4.00E+1	5.75E-4	1.10E-1	5.75E-4			8.00E-1	7.19E-4			3.50E+0	1.64E-4			3.50E+0	1.64E-4	3.40E+2	1.69E-6
		Total REER								**1.66E-3**				**2.80E-4**				**2.80E-4**		**2.67E-4**
MR	7439-97-6	Mercury and compounds	2.35E-1	3.38E-6	4.70E-3	2.47E-5			7.70E-2	4.39E-5			6.30E-1	5.36E-6			6.30E-1	5.36E-6	6.00E-1	4.11E-5
		Total REER								**4.39E-5**				**5.36E-6**				**5.36E-6**		**4.11E-5**
MFP	7440-38-2	Arsenic and compounds	7.88E-2	1.13E-6	1.52E-3	7.96E-6	2.40E-5	4.73E-2	1.70E-4	6.67E-3	1.30E-3	8.72E-4	2.40E-3	4.73E-4	6.20E-4	1.83E-3	2.40E-3	4.73E-4	2.00E-1	3.98E-5
	7440-41-7	Beryllium and compounds	5.57E-4	8.02E-9	1.07E-5	5.63E-8	4.20E-4	1.91E-5	7.00E-3	1.15E-6	1.10E-2	7.29E-7	3.10E-2	2.59E-7	5.00E-3	1.60E-6	3.10E-2	2.59E-7	2.00E-2	2.81E-6
	7440-43-9	Cadmium and compounds	1.02E-4	1.47E-9	1.97E-6	1.03E-8	5.60E-4	2.63E-6	5.00E-3	2.94E-7	1.40E-2	1.05E-7	3.70E-2	3.98E-8	6.70E-3	2.20E-7	3.70E-2	3.98E-8	3.00E-2	3.44E-7
	7440-48-4	Cobalt and compounds	7.26E-4	1.04E-8	1.40E-5	7.33E-8			1.00E-1	1.04E-7			4.40E-1	2.37E-8			4.40E-1	2.37E-8		
	18540-29-9	Chromium VI, chromate, and dichromate particulate	1.42E-2	2.05E-7	2.74E-4	1.44E-6	3.10E-5	6.61E-3	8.30E-2	2.47E-6	5.20E-4	3.94E-4	8.80E-1	2.33E-7	1.00E-3	2.05E-4	8.80E-1	2.33E-7	3.00E-1	4.80E-6
	7439-96-5	Manganese and compounds	3.88E-2	5.58E-7	7.46E-4	3.91E-6			9.00E-2	6.20E-6			4.00E-1	1.39E-6			4.00E-1	1.39E-6	3.00E-1	1.30E-5
	C365	Nickel compounds, insoluble	2.36E-3	3.40E-8	4.54E-5	2.38E-7	3.80E-3	8.94E-6	1.40E-2	2.43E-6	1.00E-1	3.40E-7	6.20E-2	5.48E-7	4.60E-2	7.39E-7	6.20E-2	5.48E-7	2.00E-1	1.19E-6
	7439-92-1	Lead and compounds	3.30E-3	4.74E-8	6.34E-5	3.33E-7			1.50E-1	3.16E-7			6.60E-1	7.19E-8			6.60E-1	7.19E-8	1.50E-1	2.22E-6
	7440-36-0	Antimony and compounds	2.12E-2	3.05E-7	4.07E-4	2.14E-6			3.00E-1	1.02E-6			1.30E+0	2.34E-7			1.30E+0	2.34E-7	1.00E+0	2.14E-6
	7440-39-3	Barium and compounds	3.38E-1	4.86E-6	6.50E-3	3.41E-5														
	7440-50-8	Copper and compounds	9.11E-3	1.31E-7	1.75E-4	9.19E-7													1.00E+2	9.19E-9
	1313-27-5	Molybdenum trioxide	4.49E-3	6.46E-8	8.64E-5	4.54E-7														
	7440-62-2	Vanadium (fume or dust)	8.21E-3	1.18E-7	1.58E-4	8.28E-7			1.00E-1	1.18E-6			4.40E-1	2.68E-7			4.40E-1	2.68E-7	8.00E-1	1.04E-6
	7440-66-6	Zinc and compounds	8.41E-3	1.21E-7	1.62E-4	8.49E-7														
	7440-22-4	Silver and compounds	4.78E-3	6.87E-8	9.18E-5	4.82E-7														
		Total REER						**5.39E-2**		**8.25E-3**		**1.27E-3**		**8.35E-4**		**2.04E-3**		**8.35E-4**		**6.74E-5**
MFHG	7439-97-6	Mercury and compounds	1.04E+0	1.49E-5	4.14E-2	2.17E-4			7.70E-2	1.93E-4			6.30E-1	2.36E-5			6.30E-1	2.36E-5	6.00E-1	3.62E-4
		Total REER								**1.93E-4**				**2.36E-5**				**2.36E-5**		**3.62E-4**
MFP	7631-86-9	Silica, crystalline (respirable)	3.25E+2	4.68E-3	6.25E+0	3.28E-2			3.00E+0	1.56E-3			1.30E+1	3.60E-4			1.30E+1	3.60E-4		
		Total REER						**5.39E-2**		**8.25E-3**		**1.27E-3**		**8.35E-4**		**2.04E-3**		**8.35E-4**		**6.74E-5**
UFD	7440-36-0	Antimony and compounds	1.27E-2	1.82E-7	6.08E-5	3.19E-7			3.00E-1	6.07E-7			1.30E+0	1.40E-7			1.30E+0	1.40E-7	1.00E+0	3.19E-7
	7440-38-2	Arsenic and compounds	4.59E-2	6.61E-7	2.21E-4	1.16E-6	2.40E-5	2.75E-2	1.70E-4	3.89E-3	1.30E-3	5.08E-4	2.40E-3	2.75E-4	6.20E-4	1.07E-3	2.40E-3	2.75E-4	2.00E-1	5.80E-6
	7440-41-7	Beryllium and compounds	3.50E-4	5.03E-9	1.68E-6	8.83E-9	4.20E-4	1.20E-5	7.00E-3	7.19E-7	1.10E-2	4.57E-7	3.10E-2	1.62E-7	5.00E-3	1.01E-6	3.10E-2	1.62E-7	2.00E-2	4.41E-7
	7440-43-9	Cadmium and compounds	6.03E-5	8.68E-10	2.90E-7	1.52E-9	5.60E-4	1.55E-6	5.00E-3	1.74E-7	1.40E-2	6.20E-8	3.70E-2	2.35E-8	6.70E-3	1.30E-7	3.70E-2	2.35E-8	3.00E-2	5.08E-8
	18540-29-9	Chromium VI, chromate, and dichromate particulate	8.22E-3	1.18E-7	3.95E-5	2.07E-7	3.10E-5	3.81E-3	8.30E-2	1.42E-6	5.20E-4	2.27E-4	8.80E-1	1.34E-7	1.00E-3	1.18E-4	8.80E-1	1.34E-7	3.00E-1	6.91E-7
	7440-48-4	Cobalt and compounds	4.68E-4	6.73E-9	2.25E-6	1.18E-8			1.00E-1	6.73E-8			4.40E-1	1.53E-8			4.40E-1	1.53E-8		
	7439-92-1	Lead and compounds	1.99E-3	2.87E-8	9.58E-6	5.03E-8			1.50E-1	1.91E-7			6.60E-1	4.34E-8			6.60E-1	4.34E-8	1.50E-1	3.35E-7
	7439-96-5	Manganese and compounds	2.34E-2	3.37E-7	1.13E-4	5.91E-7			9.00E-2	3.74E-6			4.00E-1	8.43E-7			4.00E-1	8.43E-7	3.00E-1	1.97E-6
	7439-97-6	Mercury and compounds	6.78E-4	9.75E-9	3.26E-6	1.71E-8			7.70E-2	1.27E-7			6.30E-1	1.55E-8			6.30E-1	1.55E-8	6.00E-1	2.85E-8
	C365	Nickel compounds, insoluble	1.38E-3	1.99E-8	6.65E-6	3.49E-8	3.80E-3	5.24E-6	1.40E-2	1.42E-6	1.00E-1	1.99E-7	6.20E-2	3.21E-7	4.60E-2	4.32E-7	6.20E-2	3.21E-7	2.00E-1	1.75E-7
	7631-86-9	Silica, crystalline (respirable)	9.59E+1	1.38E-3	4.61E-1	2.42E-3			3.00E+0	4.60E-4			1.30E+1	1.06E-4			1.30E+1	1.06E-4		
	7440-39-3	Barium and compounds	2.01E-1	2.89E-6	9.65E-4	5.07E-6														
	7440-50-8	Copper and compounds	5.10E-3	7.34E-8	2.45E-5	1.29E-7													1.00E+2	1.29E-9
	7440-62-2	Vanadium (fume or dust)	4.95E-3	7.12E-8	2.38E-5	1.25E-7			1.00E-1	7.12E-7			4.40E-1	1.62E-7			4.40E-1	1.62E-7	8.00E-1	1.56E-7
	7440-66-6	Zinc and compounds	5.00E-3	7.19E-8	2.40E-5	1.26E-7														
	7440-22-4	Silver and compounds	2.57E-3	3.70E-8	1.24E-5	6.50E-8														
	1313-27-5	Molybdenum trioxide	2.57E-3	3.70E-8	1.24E-5	6.50E-8														
		Total REER						**3.14E-2**		**4.35E-3**		**7.36E-4**		**3.83E-4**		**1.19E-3**		**3.83E-4**		**9.97E-6**
AFD	7440-36-0	Antimony and compounds	1.44E-1	2.07E-6	7.71E-4	4.05E-6			3.00E-1	6.88E-6			1.30E+0	1.59E-6			1.30E+0	1.59E-6	1.00E+0	4.05E-6
	7440-38-2	Arsenic and compounds	4.42E-1	6.36E-6	2.34E-3	1.23E-5	2.40E-5	2.65E-1	1.70E-4	3.74E-2	1.30E-3	4.89E-3	2.40E-3	2.65E-3	6.20E-4	1.03E-2	2.40E-3	2.65E-3	2.00E-1	6.15E-5
	7440-41-7	Beryllium and compounds	5.12E-3	7.37E-8	2.79E-5	1.47E-7	4.20E-4	1.75E-4	7.00E-3	1.05E-5	1.10E-2	6.70E-6	3.10E-2	2.38E-6	5.00E-3	1.47E-5	3.10E-2	2.38E-6	2.00E-2	7.34E-6
	7440-43-9	Cadmium and compounds	6.34E-4	9.12E-9	3.39E-6	1.78E-8	5.60E-4	1.63E-5	5.00E-3	1.82E-6	1.40E-2	6.51E-7	3.70E-2	2.47E-7	6.70E-3	1.36E-6	3.70E-2	2.47E-7	3.00E-2	5.93E-7
	18540-29-9	Chromium VI, chromate, and dichromate particulate	7.33E-2	1.05E-6	3.86E-4	2.03E-6	3.10E-5	3.40E-2	8.30E-2	1.27E-5	5.20E-4	2.03E-3	8.80E-1	1.20E-6	1.00E-3	1.05E-3	8.80E-1	1.20E-6	3.00E-1	6.76E-6
	7440-48-4	Cobalt and compounds	7.64E-3	1.10E-7	4.19E-5	2.20E-7			1.00E-1	1.10E-6			4.40E-1	2.50E-7			4.40E-1	2.50E-7		
	7439-92-1	Lead and compounds	2.42E-2	3.48E-7	1.31E-4	6.86E-7			1.50E-1	2.32E-6			6.60E-1	5.28E-7			6.60E-1	5.28E-7	1.50E-1	4.57E-6
	7439-96-5	Manganese and compounds	2.84E-1	4.09E-6	1.53E-3	8.05E-6			9.00E-2	4.55E-5			4.00E-1	1.02E-5			4.00E-1	1.02E-5	3.00E-1	2.68E-5
	7439-97-6	Mercury and compounds	7.29E-3	1.05E-7	3.90E-5	2.05E-7			7.70E-2	1.36E-6			6.30E-1	1.66E-7			6.30E-1	1.66E-7	6.00E-1	3.41E-7
	C365	Nickel compounds, insoluble	1.38E-2	1.99E-7	7.35E-5	3.86E-7	3.80E-3	5.23E-5	1.40E-2	1.42E-5	1.00E-1	1.99E-6	6.20E-2	3.21E-6	4.60E-2	4.32E-6	6.20E-2	3.21E-6	2.00E-1	1.93E-6
	7631-86-9	Silica, crystalline (respirable)	9.90E+2	1.42E-2	5.30E+0	2.78E-2			3.00E+0	4.74E-3			1.30E+1	1.09E-3			1.30E+1	1.09E-3		
	7440-39-3	Barium and compounds	2.20E+0	3.16E-5	1.18E-2	6.18E-5														
	7440-50-8	Copper and compounds	3.50E-2	5.03E-7	1.79E-4	9.42E-7													1.00E+2	9.42E-9
	7440-62-2	Vanadium (fume or dust)	5.95E-2	8.56E-7	3.21E-4	1.68E-6			1.00E-1	8.56E-6			4.40E-1	1.95E-6			4.40E-1	1.95E-6	8.00E-1	2.11E-6
	7440-66-6	Zinc and compounds	5.54E-2	7.97E-7	2.97E-4	1.56E-6														
	7440-22-4	Silver and compounds	1.03E-2	1.48E-7	4.83E-5	2.53E-7														
	1313-27-5	Molybdenum trioxide	2.17E-2	3.12E-7	1.14E-4	5.97E-7														
		Total REER						**2.99E-1**		**4.22E-2**		**6.93E-3**		**3.77E-3**		**1.13E-2**		**3.77E-3**		**1.16E-4**

TEU	CAS	TAC	Emissions				Residential				Non-Residential Child				Non-Residential Worker				Acute	
			Annual		Daily		Cancer		Noncancer		Cancer		Noncancer		Cancer		Noncancer			
			lb/yr	g/s	lb/day	g/s	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)
TSF	74-90-8	Cyanide, Hydrogen	1.26E+3	1.81E-2	4.40E+0	2.31E-2			8.00E-1	2.27E-2			3.50E+0	5.18E-3			3.50E+0	5.18E-3	3.40E+2	6.79E-5
	Total REER									**2.27E-2**				**5.18E-3**				**5.18E-3**		**6.79E-5**
POND	74-90-8	Cyanide, Hydrogen	2.58E+2	3.72E-3	1.05E+0	5.49E-3			8.00E-1	4.65E-3			3.50E+0	1.06E-3			3.50E+0	1.06E-3	3.40E+2	1.62E-5
	Total REER									**4.65E-3**				**1.06E-3**				**1.06E-3**		**1.62E-5**
LEACH1	74-90-8	Cyanide, Hydrogen	4.19E+2	6.03E-3	1.15E+0	6.03E-3			8.00E-1	7.53E-3			3.50E+0	1.72E-3			3.50E+0	1.72E-3	3.40E+2	1.77E-5
	Total REER									**7.53E-3**				**1.72E-3**				**1.72E-3**		**1.77E-5**
LEACH2	74-90-8	Cyanide, Hydrogen	4.19E+2	6.03E-3	1.15E+0	6.03E-3			8.00E-1	7.53E-3			3.50E+0	1.72E-3			3.50E+0	1.72E-3	3.40E+2	1.77E-5
	Total REER									**7.53E-3**				**1.72E-3**				**1.72E-3**		**1.77E-5**
CILTANK1	74-90-8	Cyanide, Hydrogen	2.09E+2	3.01E-3	5.74E-1	3.01E-3			8.00E-1	3.77E-3			3.50E+0	8.61E-4			3.50E+0	8.61E-4	3.40E+2	8.86E-6
	Total REER									**3.77E-3**				**8.61E-4**				**8.61E-4**		**8.86E-6**
CILTANK2	74-90-8	Cyanide, Hydrogen	2.09E+2	3.01E-3	5.74E-1	3.01E-3			8.00E-1	3.77E-3			3.50E+0	8.61E-4			3.50E+0	8.61E-4	3.40E+2	8.86E-6
	Total REER									**3.77E-3**				**8.61E-4**				**8.61E-4**		**8.86E-6**
CILTANK3	74-90-8	Cyanide, Hydrogen	2.09E+2	3.01E-3	5.74E-1	3.01E-3			8.00E-1	3.77E-3			3.50E+0	8.61E-4			3.50E+0	8.61E-4	3.40E+2	8.86E-6
	Total REER									**3.77E-3**				**8.61E-4**				**8.61E-4**		**8.86E-6**
CILTANK4	74-90-8	Cyanide, Hydrogen	2.09E+2	3.01E-3	5.74E-1	3.01E-3			8.00E-1	3.77E-3			3.50E+0	8.61E-4			3.50E+0	8.61E-4	3.40E+2	8.86E-6
	Total REER									**3.77E-3**				**8.61E-4**				**8.61E-4**		**8.86E-6**
CILTANK5	74-90-8	Cyanide, Hydrogen	2.09E+2	3.01E-3	5.74E-1	3.01E-3			8.00E-1	3.77E-3			3.50E+0	8.61E-4			3.50E+0	8.61E-4	3.40E+2	8.86E-6
	Total REER									**3.77E-3**				**8.61E-4**				**8.61E-4**		**8.86E-6**
CILTANK6	74-90-8	Cyanide, Hydrogen	2.09E+2	3.01E-3	5.74E-1	3.01E-3			8.00E-1	3.77E-3			3.50E+0	8.61E-4			3.50E+0	8.61E-4	3.40E+2	8.86E-6
	Total REER									**3.77E-3**				**8.61E-4**				**8.61E-4**		**8.86E-6**
CILTANK7	74-90-8	Cyanide, Hydrogen	2.09E+2	3.01E-3	5.74E-1	3.01E-3			8.00E-1	3.77E-3			3.50E+0	8.61E-4			3.50E+0	8.61E-4	3.40E+2	8.86E-6
	Total REER									**3.77E-3**				**8.61E-4**				**8.61E-4**		**8.86E-6**
CEM1	7440-38-2	Arsenic and compounds	2.67E-3	3.83E-8	1.14E-5	5.97E-8	2.40E-5	1.60E-3	1.70E-4	2.26E-4	1.30E-3	2.95E-5	2.40E-3	1.60E-5	6.20E-4	6.18E-5	2.40E-3	1.60E-5	2.00E-1	2.99E-7
	7440-41-7	Beryllium and compounds	2.43E-4	3.49E-9	1.04E-6	5.44E-9	4.20E-4	8.31E-6	7.00E-3	4.99E-7	1.10E-2	3.17E-7	3.10E-2	1.13E-7	5.00E-3	6.98E-7	3.10E-2	1.13E-7	2.00E-2	2.72E-7
	7440-43-9	Cadmium and compounds	7.61E-5	1.09E-9	3.25E-7	1.70E-9	5.60E-4	1.95E-6	5.00E-3	2.19E-7	1.40E-2	7.82E-8	3.70E-2	2.96E-8	6.70E-3	1.63E-7	3.70E-2	2.96E-8	3.00E-2	5.68E-8
	18540-29-9	Chromium VI, chromate, and dichromate particulate	3.64E-3	5.23E-8	1.55E-5	8.15E-8	3.10E-5	1.69E-3	8.30E-2	6.30E-7	5.20E-4	1.01E-4	8.80E-1	5.94E-8	1.00E-3	5.23E-5	8.80E-1	5.94E-8	3.00E-1	2.72E-7
	7439-92-1	Lead and compounds	1.53E-3	2.20E-8	6.52E-6	3.42E-8			1.50E-1	1.46E-7			6.60E-1	3.33E-8			6.60E-1	3.33E-8	1.50E-1	2.28E-7
	7439-96-5	Manganese and compounds	2.55E-3	3.67E-8	1.09E-5	5.72E-8			9.00E-2	4.08E-7			4.00E-1	9.18E-8			4.00E-1	9.18E-8	3.00E-1	1.91E-7
	C365	Nickel compounds, insoluble	6.60E-3	9.49E-8	2.82E-5	1.48E-7	3.80E-3	2.50E-5	1.40E-2	6.78E-6	1.00E-1	9.49E-7	6.20E-2	1.53E-6	4.60E-2	2.06E-6	6.20E-2	1.53E-6	2.00E-1	7.39E-7
	12185-10-3	Phosphorus, white	1.30E-2	1.87E-7	5.55E-5	2.91E-7			9.00E+0	2.08E-8			4.00E+1	4.68E-9			4.00E+1	4.68E-9	2.00E+1	1.46E-8
	7782-49-2	Selenium and compounds	1.88E-4	2.70E-9	8.03E-7	4.21E-9													2.00E+0	2.11E-9
	7631-86-9	Silica, crystalline (respirable)	1.27E-1	1.83E-6	5.44E-4	2.86E-6			3.00E+0	6.11E-7			1.30E+1	1.41E-7			1.30E+1	1.41E-7		
	Total REER							**3.32E-3**		**2.35E-4**		**1.31E-4**		**1.80E-5**		**1.17E-4**		**1.80E-5**		**2.07E-6**
CEM2	7440-38-2	Arsenic and compounds	2.67E-3	3.83E-8	1.14E-5	5.97E-8	2.40E-5	1.60E-3	1.70E-4	2.26E-4	1.30E-3	2.95E-5	2.40E-3	1.60E-5	6.20E-4	6.18E-5	2.40E-3	1.60E-5	2.00E-1	2.99E-7
	7440-41-7	Beryllium and compounds	2.43E-4	3.49E-9	1.04E-6	5.44E-9	4.20E-4	8.31E-6	7.00E-3	4.99E-7	1.10E-2	3.17E-7	3.10E-2	1.13E-7	5.00E-3	6.98E-7	3.10E-2	1.13E-7	2.00E-2	2.72E-7
	7440-43-9	Cadmium and compounds	7.61E-5	1.09E-9	3.25E-7	1.70E-9	5.60E-4	1.95E-6	5.00E-3	2.19E-7	1.40E-2	7.82E-8	3.70E-2	2.96E-8	6.70E-3	1.63E-7	3.70E-2	2.96E-8	3.00E-2	5.68E-8
	18540-29-9	Chromium VI, chromate, and dichromate particulate	3.64E-3	5.23E-8	1.55E-5	8.15E-8	3.10E-5	1.69E-3	8.30E-2	6.30E-7	5.20E-4	1.01E-4	8.80E-1	5.94E-8	1.00E-3	5.23E-5	8.80E-1	5.94E-8	3.00E-1	2.72E-7
	7439-92-1	Lead and compounds	1.53E-3	2.20E-8	6.52E-6	3.42E-8			1.50E-1	1.46E-7			6.60E-1	3.33E-8			6.60E-1	3.33E-8	1.50E-1	2.28E-7
	7439-96-5	Manganese and compounds	2.55E-3	3.67E-8	1.09E-5	5.72E-8			9.00E-2	4.08E-7			4.00E-1	9.18E-8			4.00E-1	9.18E-8	3.00E-1	1.91E-7
	C365	Nickel compounds, insoluble	6.60E-3	9.49E-8	2.82E-5	1.48E-7	3.80E-3	2.50E-5	1.40E-2	6.78E-6	1.00E-1	9.49E-7	6.20E-2	1.53E-6	4.60E-2	2.06E-6	6.20E-2	1.53E-6	2.00E-1	7.39E-7
	12185-10-3	Phosphorus, white	1.30E-2	1.87E-7	5.55E-5	2.91E-7			9.00E+0	2.08E-8			4.00E+1	4.68E-9			4.00E+1	4.68E-9	2.00E+1	1.46E-8
	7782-49-2	Selenium and compounds	1.88E-4	2.70E-9	8.03E-7	4.21E-9													2.00E+0	2.11E-9
	7631-86-9	Silica, crystalline (respirable)	1.27E-1	1.83E-6	5.44E-4	2.86E-6			3.00E+0	6.11E-7			1.30E+1	1.41E-7			1.30E+1	1.41E-7		
	Total REER							**3.32E-3**		**2.35E-4**		**1.31E-4**		**1.80E-5**		**1.17E-4**		**1.80E-5**		**2.07E-6**
CEM3	7440-38-2	Arsenic and compounds	2.45E-1	3.52E-6	1.11E-3	5.81E-6	2.40E-5	1.47E-1	1.70E-4	2.07E-2	1.30E-3	2.71E-3	2.40E-3	1.47E-3	6.20E-4	5.68E-3	2.40E-3	1.47E-3	2.00E-1	2.91E-5
	7440-41-7	Beryllium and compounds	3.14E-3	4.52E-8	1.42E-5	7.46E-8	4.20E-4	1.08E-4	7.00E-3	6.46E-6	1.10E-2	4.11E-6	3.10E-2	1.46E-6	5.00E-3	9.04E-6	3.10E-2	1.46E-6	2.00E-2	3.73E-6
	7440-43-9	Cadmium and compounds	3.61E-4	5.19E-9	1.63E-6	8.56E-9	5.60E-4	9.27E-6	5.00E-3	1.04E-6	1.40E-2	3.71E-7	3.70E-2	1.40E-7	6.70E-3	7.75E-7	3.70E-2	1.40E-7	3.00E-2	2.85E-7
	7440-48-4	Cobalt and compounds	4.78E-3	6.87E-8	2.16E-5	1.13E-7			1.00E-1	6.87E-7			4.40E-1	1.56E-7			4.40E-1	1.56E-7		
	18540-29-9	Chromium VI, chromate, and dichromate particulate	3.96E-2	5.70E-7	1.79E-4	9.40E-7	3.10E-5	1.84E-2	8.30E-2	6.87E-6	5.20E-4	1.10E-3	8.80E-1	6.48E-7	1.00E-3	5.70E-4	8.80E-1	6.48E-7	3.00E-1	3.13E-6
	7439-97-6	Mercury and compounds	4.17E-3	6.01E-8	1.89E-5	9.90E-8			7.70E-2	7.80E-7			6.30E-1	9.53E-8			6.30E-1	9.53E-8	6.00E-1	1.65E-7
	7439-96-5	Manganese and compounds	1.68E-1	2.41E-6	7.58E-4	3.98E-6			9.00E-2	2.68E-5			4.00E-1	6.04E-6			4.00E-1	6.04E-6	3.00E-1	1.33E-5
	C365	Nickel compounds, insoluble	7.75E-3	1.11E-7	3.50E-5	1.84E-7	3.80E-3	2.93E-5	1.40E-2	7.96E-6	1.00E-1	1.11E-6	6.20E-2	1.80E-6	4.60E-2	2.42E-6	6.20E-2	1.80E-6	2.00E-1	9.19E-7
	7439-92-1	Lead and compounds	1.43E-2	2.06E-7	6.46E-5	3.39E-7			1.50E-1	1.37E-6			6.60E-1	3.12E-7			6.60E-1	3.12E-7	1.50E-1	2.26E-6
	7440-36-0	Antimony and compounds	8.34E-2	1.20E-6	3.77E-4	1.98E-6			3.00E-1	4.00E-6			1.30E+0	9.23E-7			1.30E+0	9.23E-7	1.00E+0	1.98E-6
	7440-39-3	Barium and compounds	1.27E+0	1.82E-5	5.72E-3	3.00E-5														
	7440-50-8	Copper and compounds	1.70E-2	2.44E-7	7.67E-5	4.03E-7													1.00E+2	4.03E-9
	7440-62-2	Vanadium (fume or dust)	3.50E-2	5.04E-7	1.58E-4	8.31E-7			1.00E-1	5.04E-6			4.40E-1	1.15E-6			4.40E-1	1.15E-6	8.00E-1	1.04E-6
	7440-66-6	Zinc and compounds	3.20E-2	4.60E-7	1.44E-4	7.58E-7														
	1313-27-5	Molybdenum trioxide	1.15E-2	1.65E-7	5.19E-5	2.73E-7														
	7440-22-4	Silver and compounds	3.21E-3	4.62E-8	1.45E-5	7.62E-8														
	7631-86-9	Silica, crystalline (respirable)	5.23E+2	7.52E-3	2.36E+0	1.24E-2			3.00E+0	2.51E-3			1.30E+1	5.78E-4			1.30E+1	5.78E-4		
	Total REER							**1.65E-1**		**2.33E-2**		**3.81E-3**		**2.06E-3**		**6.27E-3**		**2.06E-3**		**5.58E-5**

TEU	CAS	TAC	Emissions				Residential				Non-Residential Child				Non-Residential Worker				Acute	
			Annual		Daily		Cancer		Noncancer		Cancer		Noncancer		Cancer		Noncancer			
			lb/yr	g/s	lb/day	g/s	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)
CEM4	7440-38-2	Arsenic and compounds	1.70E-1	2.45E-6	7.70E-4	4.04E-6	2.40E-5	1.02E-1	1.70E-4	1.44E-2	1.30E-3	1.89E-3	2.40E-3	1.02E-3	6.20E-4	3.95E-3	2.40E-3	1.02E-3	2.00E-1	2.02E-5
	7440-41-7	Beryllium and compounds	2.19E-3	3.15E-8	9.88E-6	5.19E-8	4.20E-4	7.49E-5	7.00E-3	4.49E-6	1.10E-2	2.86E-6	3.10E-2	1.01E-6	5.00E-3	6.29E-6	3.10E-2	1.01E-6	2.00E-2	2.59E-6
	7440-43-9	Cadmium and compounds	2.51E-4	3.61E-9	1.13E-6	5.95E-9	5.60E-4	6.45E-6	5.00E-3	7.22E-7	1.40E-2	2.58E-7	3.70E-2	9.76E-8	6.70E-3	5.39E-7	3.70E-2	9.76E-8	3.00E-2	1.98E-7
	7440-48-4	Cobalt and compounds	3.32E-3	4.78E-8	1.50E-5	7.88E-8			1.00E-1	4.78E-7			4.40E-1	1.09E-7			4.40E-1	1.09E-7		
	18540-29-9	Chromium VI, chromate, and dichromate particulate	2.76E-2	3.97E-7	1.25E-4	6.54E-7	3.10E-5	1.28E-2	8.30E-2	4.78E-6	5.20E-4	7.63E-4	8.80E-1	4.51E-7	1.00E-3	3.97E-4	8.80E-1	4.51E-7	3.00E-1	2.18E-6
	7439-97-6	Mercury and compounds	2.90E-3	4.18E-8	1.31E-5	6.89E-8			7.70E-2	5.43E-7			6.30E-1	6.63E-8			6.30E-1	6.63E-8	6.00E-1	1.15E-7
	7439-96-5	Manganese and compounds	1.17E-1	1.68E-6	5.28E-4	2.77E-6			9.00E-2	1.87E-5			4.00E-1	4.20E-6			4.00E-1	4.20E-6	3.00E-1	9.23E-6
	C365	Nickel compounds, insoluble	5.39E-3	7.75E-8	2.44E-5	1.28E-7	3.80E-3	2.04E-5	1.40E-2	5.54E-6	1.00E-1	7.75E-7	6.20E-2	1.25E-6	4.60E-2	1.69E-6	6.20E-2	1.25E-6	2.00E-1	6.39E-7
	7439-92-1	Lead and compounds	9.94E-3	1.43E-7	4.49E-5	2.36E-7			1.50E-1	9.54E-7			6.60E-1	2.17E-7			6.60E-1	2.17E-7	1.50E-1	1.57E-6
	7440-36-0	Antimony and compounds	5.80E-2	8.34E-7	2.62E-4	1.38E-6			3.00E-1	2.78E-6			1.30E+0	6.42E-7			1.30E+0	6.42E-7	1.00E+0	1.38E-6
	7440-39-3	Barium and compounds	8.80E-1	1.27E-5	3.98E-3	2.09E-5														
	7440-50-8	Copper and compounds	1.18E-2	1.70E-7	5.34E-5	2.80E-7													1.00E+2	2.80E-9
	7440-62-2	Vanadium (fume or dust)	2.44E-2	3.51E-7	1.10E-4	5.78E-7			1.00E-1	3.51E-6			4.40E-1	7.97E-7			4.40E-1	7.97E-7	8.00E-1	7.23E-7
	7440-66-6	Zinc and compounds	2.22E-2	3.20E-7	1.00E-4	5.27E-7														
	1313-27-5	Molybdenum trioxide	8.00E-3	1.15E-7	3.61E-5	1.90E-7														
	7440-22-4	Silver and compounds	2.24E-3	3.21E-8	1.01E-5	5.30E-8														
	7631-86-9	Silica, crystalline (respirable)	4.43E+2	6.38E-3	2.00E+0	1.05E-2			3.00E+0	2.13E-3			1.30E+1	4.91E-4			1.30E+1	4.91E-4		
		Total REER						**1.15E-1**		**1.66E-2**		**2.65E-3**		**1.52E-3**		**4.36E-3**		**1.52E-3**		**3.88E-5**
CEM5	7440-38-2	Arsenic and compounds	5.55E-3	7.98E-8	2.51E-5	1.32E-7	2.40E-5	3.32E-3	1.70E-4	4.69E-4	1.30E-3	6.14E-5	2.40E-3	3.32E-5	6.20E-4	1.29E-4	2.40E-3	3.32E-5	2.00E-1	6.60E-7
	7440-43-9	Cadmium and compounds	1.33E-5	1.91E-10	6.03E-8	3.16E-10	5.60E-4	3.42E-7	5.00E-3	3.83E-8	1.40E-2	1.37E-8	3.70E-2	5.17E-9	6.70E-3	2.86E-8	3.70E-2	5.17E-9	3.00E-2	1.05E-8
	18540-29-9	Chromium VI, chromate, and dichromate particulate	2.38E-3	3.42E-8	1.08E-5	5.66E-8	3.10E-5	1.10E-3	8.30E-2	4.12E-7	5.20E-4	6.58E-5	8.80E-1	3.89E-8	1.00E-3	3.42E-5	8.80E-1	3.89E-8	3.00E-1	1.89E-7
	7439-92-1	Lead and compounds	6.86E-4	9.87E-9	3.11E-6	1.63E-8			1.50E-1	6.58E-8			6.60E-1	1.49E-8			6.60E-1	1.49E-8	1.50E-1	1.09E-7
	7439-96-5	Manganese and compounds	7.08E-2	1.02E-6	3.21E-4	1.68E-6			9.00E-2	1.13E-5			4.00E-1	2.55E-6			4.00E-1	2.55E-6	3.00E-1	5.61E-6
	C365	Nickel compounds, insoluble	4.65E-3	6.69E-8	2.11E-5	1.11E-7	3.80E-3	1.76E-5	1.40E-2	4.78E-6	1.00E-1	6.69E-7	6.20E-2	1.08E-6	4.60E-2	1.45E-6	6.20E-2	1.08E-6	2.00E-1	5.53E-7
	12185-10-3	Phosphorus, white	3.00E-2	4.31E-7	1.36E-4	7.13E-7			9.00E+0	4.79E-8			4.00E+1	1.08E-8			4.00E+1	1.08E-8	2.00E+1	3.56E-8
	7631-86-9	Silica, crystalline (respirable)	2.55E-1	3.67E-6	1.09E-3	5.71E-6			3.00E+0	1.22E-6			1.30E+1	2.82E-7			1.30E+1	2.82E-7		
		Total REER						**4.45E-3**		**4.87E-4**		**1.28E-4**		**3.72E-5**		**1.64E-4**		**3.72E-5**		**7.17E-6**

TEU	CAS	TAC	Emissions				Residential				Non-Residential Child				Non-Residential Worker				Acute	
			Annual		Daily		Cancer		Noncancer		Cancer		Noncancer		Cancer		Noncancer			
			lb/yr	g/s	lb/day	g/s	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)
	106-99-0	1,3-Butadiene	3.57E+1	5.13E-4	1.72E-1	9.01E-4	3.30E-2	1.56E-2	2.00E+0	2.57E-4	8.60E-1	5.97E-4	8.80E+0	5.83E-5	4.00E-1	1.28E-3	8.80E+0	5.83E-5	6.60E+2	1.36E-6
	83-32-9	Acenaphthene	5.50E-1	7.91E-6	2.64E-3	1.39E-5														
	208-96-8	Acenaphthylene	6.67E-1	9.60E-6	3.21E-3	1.68E-5														
	75-07-0	Acetaldehyde	1.29E+2	1.85E-3	6.18E-1	3.24E-3	4.50E-1	4.11E-3	1.40E+2	1.32E-5	1.20E+1	1.54E-4	6.20E+2	2.98E-6	5.50E+0	3.36E-4	6.20E+2	2.98E-6	4.70E+2	6.90E-6
	107-02-8	Acrolein	5.56E+0	8.00E-5	2.68E-2	1.40E-4			3.50E-1	2.29E-4			1.50E+0	5.34E-5			1.50E+0	5.34E-5	6.90E+0	2.04E-5
	7664-41-7	Ammonia	4.76E+2	6.85E-3	2.29E+0	1.20E-2			5.00E+2	1.37E-5			2.20E+3	3.11E-6			2.20E+3	3.11E-6	1.20E+3	1.00E-5
	120-12-7	Anthracene	6.59E-1	9.48E-6	3.17E-3	1.66E-5														
	7440-38-2	Arsenic and compounds	2.63E-1	3.78E-6	1.26E-3	6.63E-6	2.40E-5	1.57E-1	1.70E-4	2.22E-2	1.30E-3	2.91E-3	2.40E-3	1.57E-3	6.20E-4	6.09E-3	2.40E-3	1.57E-3	2.00E-1	3.31E-5
	71-43-2	Benzene	3.06E+1	4.40E-4	1.47E-1	7.72E-4	1.30E-1	3.38E-3	3.00E+0	1.47E-4	3.30E+0	1.33E-4	1.30E+1	3.38E-5	1.50E+0	2.93E-4	1.30E+1	3.38E-5	2.90E+1	2.66E-5
	56-55-3	Benz[a]anthracene	6.41E-1	9.22E-6	3.08E-3	1.62E-5	2.10E-4	4.39E-2			7.80E-3	1.18E-3			1.50E-2	6.14E-4				
	50-32-8	Benzo[a]pyrene	5.83E-3	8.38E-8	2.80E-5	1.47E-7	4.30E-5	1.95E-3	2.00E-3	4.19E-5	1.60E-3	5.24E-5	8.80E-3	9.52E-6	3.00E-3	2.79E-5	8.80E-3	9.52E-6	2.00E-3	7.35E-5
	205-99-2	Benzo[b]fluoranthene	1.10E+0	1.58E-5	5.29E-3	2.77E-5	5.30E-5	2.98E-1			2.00E-3	7.91E-3			3.80E-3	4.16E-3				
	191-24-2	Benzo[g,h,i]perylene	4.68E-4	6.73E-9	2.25E-6	1.18E-8	4.70E-3	1.43E-6			1.70E-1	3.96E-8			3.40E-1	1.98E-8				
	207-08-9	Benzo[k]fluoranthene	1.10E+0	1.58E-5	5.29E-3	2.77E-5	1.40E-3	1.13E-2			5.20E-2	3.04E-4			1.00E-1	1.58E-4				
	7440-43-9	Cadmium and compounds	2.46E-1	3.54E-6	1.18E-3	6.21E-6	5.60E-4	6.32E-3	5.00E-3	7.08E-4	1.40E-2	2.53E-4	3.70E-2	9.57E-5	6.70E-3	5.29E-4	3.70E-2	9.57E-5	3.00E-2	2.07E-4
	108-90-7	Chlorobenzene	3.28E-2	4.72E-7	1.58E-4	8.29E-7			5.00E+1	9.44E-9			2.20E+2	2.15E-9			2.20E+2	2.15E-9		
	218-01-9	Chrysene	5.87E-1	8.45E-6	2.82E-3	1.48E-5	4.30E-4	1.97E-2			1.60E-2	5.28E-4			3.00E-2	2.82E-4				
	7440-50-8	Copper and compounds	6.73E-1	9.68E-6	3.24E-3	1.70E-5													1.00E+2	1.70E-7
	53-70-3	Dibenz[a,h]anthracene	5.73E-1	8.24E-6	2.76E-3	1.45E-5	4.30E-6	1.92E+0			1.60E-4	5.15E-2			3.00E-4	2.75E-2				
	100-41-4	Ethyl benzene	1.79E+0	2.57E-5	8.60E-3	4.52E-5	4.00E-1	6.43E-5	2.60E+2	9.90E-8	1.00E+1	2.57E-6	1.10E+3	2.34E-8	4.80E+0	5.36E-6	1.10E+3	2.34E-8	2.20E+4	2.05E-9
UDP	206-44-0	Fluoranthene	6.56E-1	9.44E-6	3.15E-3	1.66E-5	5.30E-4	1.78E-2			2.00E-2	4.72E-4			3.80E-2	2.48E-4				
	86-73-7	Fluorene	3.47E+0	4.98E-5	1.67E-2	8.75E-5														
	50-00-0	Formaldehyde	2.83E+2	4.07E-3	1.36E+0	7.15E-3	1.70E-1	2.40E-2	9.00E+0	4.53E-4	4.30E+0	9.48E-4	4.00E+1	1.02E-4	2.00E+0	2.04E-3	4.00E+1	1.02E-4	4.90E+1	1.46E-4
	110-54-3	Hexane	4.42E+0	6.35E-5	2.12E-2	1.11E-4			7.00E+2	9.07E-8			3.10E+3	2.05E-8			3.10E+3	2.05E-8		
	7647-01-0	Hydrochloric Acid	3.06E+1	4.40E-4	1.47E-1	7.72E-4			2.00E+1	2.20E-5			8.80E+1	5.00E-6			8.80E+1	5.00E-6	2.10E+3	3.68E-7
	18540-29-9	Chromium VI, chromate, and dichromate particulate	1.64E-2	2.36E-7	7.89E-5	4.14E-7	3.10E-5	7.62E-3	8.30E-2	2.84E-6	5.20E-4	4.54E-4	8.80E-1	2.68E-7	1.00E-3	2.36E-4	8.80E-1	2.68E-7	3.00E-1	1.38E-6
	193-39-5	Indeno[1,2,3-cd]pyrene	5.68E-1	8.17E-6	2.73E-3	1.43E-5	6.10E-4	1.34E-2			2.20E-2	3.71E-4			4.30E-2	1.90E-4				
	7439-92-1	Lead and compounds	1.36E+0	1.96E-5	6.55E-3	3.44E-5			1.50E-1	1.31E-4			6.60E-1	2.97E-5			6.60E-1	2.97E-5	1.50E-1	2.29E-4
	7439-96-5	Manganese and compounds	5.09E-1	7.32E-6	2.45E-3	1.28E-5			9.00E-2	8.13E-5			4.00E-1	1.83E-5			4.00E-1	1.83E-5	3.00E-1	4.28E-5
	7439-97-6	Mercury and compounds	3.28E-1	4.72E-6	1.58E-3	8.29E-6			7.70E-2	6.13E-5			6.30E-1	7.49E-6			6.30E-1	7.49E-6	6.00E-1	1.38E-5
	91-20-3	Naphthalene	3.23E+0	4.65E-5	1.55E-2	8.16E-5	2.90E-2	1.60E-3	3.70E+0	1.26E-5	7.60E-1	6.12E-5	1.60E+1	2.91E-6	3.50E-1	1.33E-4	1.60E+1	2.91E-6	2.00E+2	4.08E-7
	C365	Nickel compounds, insoluble	6.40E-1	9.21E-6	3.08E-3	1.62E-5	3.80E-3	2.42E-3	1.40E-2	6.58E-4	1.00E-1	9.21E-5	6.20E-2	1.48E-4	4.60E-2	2.00E-4	6.20E-2	1.48E-4	2.00E-1	8.08E-5
	85-01-8	Phenanthrene	6.40E+0	9.21E-5	3.08E-2	1.62E-4														
	115-07-1	Propylene	7.66E+1	1.10E-3	3.69E-1	1.93E-3			3.00E+3	3.67E-7			1.30E+4	8.48E-8			1.30E+4	8.48E-8		
	129-00-0	Pyrene	1.38E+0	1.99E-5	6.65E-3	3.49E-5														
	7782-49-2	Selenium and compounds	3.61E-1	5.19E-6	1.74E-3	9.11E-6													2.00E+0	4.56E-6
	108-88-3	Toluene	1.73E+1	2.49E-4	8.32E-2	4.37E-4			5.00E+3	4.98E-8			2.20E+4	1.13E-8			2.20E+4	1.13E-8	7.50E+3	5.82E-8
	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xyl	6.96E+1	1.00E-3	3.35E-1	1.76E-3			2.20E+2	4.55E-6			9.70E+2	1.03E-6			9.70E+2	1.03E-6	8.70E+3	2.02E-7
	7440-66-6	Zinc and compounds	3.68E+0	5.29E-5	1.77E-2	9.28E-5														
	C200	Diesel Particulate Matter	5.50E+3	7.91E-2	2.64E+1	1.39E-1	1.00E-1	7.91E-1	5.00E+0	1.58E-2	2.60E+0	3.04E-2	2.20E+1	3.59E-3	1.20E+0	6.59E-2	2.20E+1	3.59E-3		
	Total REER							**3.34E+0**		**4.09E-2**		**9.84E-2**		**5.74E-3**		**1.10E-1**		**5.74E-3**		**8.99E-4**

TEU	CAS	TAC	Emissions				Residential				Non-Residential Child				Non-Residential Worker				Acute	
			Annual		Daily		Cancer		Noncancer		Cancer		Noncancer		Cancer		Noncancer			
			lb/yr	g/s	lb/day	g/s	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)
	106-99-0	1,3-Butadiene	2.98E+0	4.29E-5	7.15E-1	3.75E-3	3.30E-2	1.30E-3	2.00E+0	2.14E-5	8.60E-1	4.98E-5	8.80E+0	4.87E-6	4.00E-1	1.07E-4	8.80E+0	4.87E-6	6.60E+2	5.69E-6
	75-07-0	Acetaldehyde	1.07E+1	1.54E-4	2.58E+0	1.35E-2	4.50E-1	3.43E-4	1.40E+2	1.10E-6	1.20E+1	1.29E-5	6.20E+2	2.49E-7	5.50E+0	2.81E-5	6.20E+2	2.49E-7	4.70E+2	2.88E-5
	107-02-8	Acrolein	4.65E-1	6.68E-6	1.11E-1	5.85E-4			3.50E-1	1.91E-5			1.50E+0	4.45E-6			1.50E+0	4.45E-6	6.90E+0	8.48E-5
	7664-41-7	Ammonia	3.97E+1	5.72E-4	9.54E+0	5.01E-2			5.00E+2	1.14E-6			2.20E+3	2.60E-7			2.20E+3	2.60E-7	1.20E+3	4.17E-5
	7440-38-2	Arsenic and compounds	2.19E-2	3.15E-7	5.26E-3	2.76E-5	2.40E-5	1.31E-2	1.70E-4	1.86E-3	1.30E-3	2.43E-4	2.40E-3	1.31E-4	6.20E-4	5.09E-4	2.40E-3	1.31E-4	2.00E-1	1.38E-4
	71-43-2	Benzene	2.55E+0	3.67E-5	6.13E-1	3.22E-3	1.30E-1	2.82E-4	3.00E+0	1.22E-5	3.30E+0	1.11E-5	1.30E+1	2.82E-6	1.50E+0	2.45E-5	1.30E+1	2.82E-6	2.90E+1	1.11E-4
	7440-43-9	Cadmium and compounds	2.06E-2	2.96E-7	4.93E-3	2.59E-5	5.60E-4	5.28E-4	5.00E-3	5.91E-5	1.40E-2	2.11E-5	3.70E-2	7.99E-6	6.70E-3	4.41E-5	3.70E-2	7.99E-6	3.00E-2	8.63E-4
	108-90-7	Chlorobenzene	2.74E-3	3.94E-8	6.58E-4	3.45E-6			5.00E+1	7.88E-10			2.20E+2	1.79E-10			2.20E+2	1.79E-10		
	18540-29-9	Chromium VI, chromate, and dichromate particulate	1.37E-3	1.97E-8	3.29E-4	1.73E-6	3.10E-5	6.36E-4	8.30E-2	2.37E-7	5.20E-4	3.79E-5	8.80E-1	2.24E-8	1.00E-3	1.97E-5	8.80E-1	2.24E-8	3.00E-1	5.76E-6
	7440-50-8	Copper and compounds	5.62E-2	8.08E-7	1.35E-2	7.08E-5													1.00E+2	7.08E-7
	C200	Diesel Particulate Matter	1.69E+3	2.42E-2	2.44E+2	1.28E+0	1.00E-1	2.42E-1	5.00E+0	4.85E-3	2.60E+0	9.32E-3	2.20E+1	1.10E-3	1.20E+0	2.02E-2	2.20E+1	1.10E-3		
	100-41-4	Ethyl benzene	1.49E-1	2.15E-6	3.58E-2	1.88E-4	4.00E-1	5.37E-6	2.60E+2	8.26E-9	1.00E+1	2.15E-7	1.10E+3	1.95E-9	4.80E+0	4.48E-7	1.10E+3	1.95E-9	2.20E+4	8.55E-9
	50-00-0	Formaldehyde	2.37E+1	3.40E-4	5.68E+0	2.98E-2	1.70E-1	2.00E-3	9.00E+0	3.78E-5	4.30E+0	7.91E-5	4.00E+1	8.51E-6	2.00E+0	1.70E-4	4.00E+1	8.51E-6	4.90E+1	6.08E-4
	110-54-3	Hexane	3.69E-1	5.30E-6	8.85E-2	4.64E-4			7.00E+2	7.57E-9			3.10E+3	1.71E-9			3.10E+3	1.71E-9		
	7439-92-1	Lead and compounds	1.14E-1	1.64E-6	2.73E-2	1.43E-4			1.50E-1	1.09E-5			6.60E-1	2.48E-6			6.60E-1	2.48E-6	1.50E-1	9.55E-4
	7439-96-5	Manganese and compounds	4.25E-2	6.11E-7	1.02E-2	5.35E-5			9.00E-2	6.79E-6			4.00E-1	1.53E-6			4.00E-1	1.53E-6	3.00E-1	1.78E-4
	7439-97-6	Mercury and compounds	2.74E-2	3.94E-7	6.58E-3	3.45E-5			7.70E-2	5.12E-6			6.30E-1	6.26E-7			6.30E-1	6.26E-7	6.00E-1	5.76E-5
	91-20-3	Naphthalene	2.70E-1	3.88E-6	6.48E-2	3.40E-4	2.90E-2	1.34E-4	3.70E+0	1.05E-6	7.60E-1	5.11E-6	1.60E+1	2.43E-7	3.50E-1	1.11E-5	1.60E+1	2.43E-7	2.00E+2	1.70E-6
	C365	Nickel compounds, insoluble	5.34E-2	7.69E-7	1.28E-2	6.73E-5	3.80E-3	2.02E-4	1.40E-2	5.49E-5	1.00E-1	7.69E-6	6.20E-2	1.24E-5	4.60E-2	1.67E-5	6.20E-2	1.24E-5	2.00E-1	3.37E-4
	83-32-9	Acenaphthene	4.59E-2	6.60E-7	1.10E-2	5.79E-5														
EDG1	208-96-8	Acenaphthylene	5.57E-2	8.01E-7	1.34E-2	7.02E-5														
	120-12-7	Anthracene	5.50E-2	7.92E-7	1.32E-2	6.93E-5														
	56-55-3	Benz[a]anthracene	5.35E-2	7.69E-7	1.28E-2	6.74E-5	2.10E-4	3.66E-3			7.80E-3	9.86E-5			1.50E-2	5.13E-5				
	50-32-8	Benzo[a]pyrene	4.86E-4	7.00E-9	1.17E-4	6.13E-7	4.30E-5	1.63E-4	2.00E-3	3.50E-6	1.60E-3	4.37E-6	8.80E-3	7.95E-7	3.00E-3	2.33E-6	8.80E-3	7.95E-7	2.00E-3	3.06E-4
	205-99-2	Benzo[b]fluoranthene	9.18E-2	1.32E-6	2.20E-2	1.16E-4	5.30E-5	2.49E-2			2.00E-3	6.60E-4			3.80E-3	3.47E-4				
	191-24-2	Benzo[g,h,i]perylene	3.91E-5	5.62E-10	9.37E-6	4.92E-8	4.70E-3	1.20E-7			1.70E-1	3.30E-9			3.40E-1	1.65E-9				
	207-08-9	Benzo[k]fluoranthene	9.18E-2	1.32E-6	2.20E-2	1.16E-4	1.40E-3	9.43E-4			5.20E-2	2.54E-5			1.00E-1	1.32E-5				
	218-01-9	Chrysene	4.90E-2	7.05E-7	1.18E-2	6.18E-5	4.30E-4	1.64E-3			1.60E-2	4.41E-5			3.00E-2	2.35E-5				
	53-70-3	Dibenz[a,h]anthracene	4.78E-2	6.88E-7	1.15E-2	6.03E-5	4.30E-6	1.60E-1			1.60E-4	4.30E-3			3.00E-4	2.29E-3				
	206-44-0	Fluoranthene	5.48E-2	7.88E-7	1.31E-2	6.90E-5	5.30E-4	1.49E-3			2.00E-2	3.94E-5			3.80E-2	2.07E-5				
	86-73-7	Fluorene	2.89E-1	4.16E-6	6.94E-2	3.65E-4														
	193-39-5	Indeno[1,2,3-cd]pyrene	4.74E-2	6.82E-7	1.14E-2	5.98E-5	6.10E-4	1.12E-3			2.20E-2	3.10E-5			4.30E-2	1.59E-5				
	85-01-8	Phenanthrene	5.34E-1	7.69E-6	1.28E-1	6.73E-4														
	129-00-0	Pyrene	1.15E-1	1.66E-6	2.77E-2	1.45E-4														
	115-07-1	Propylene	6.40E+0	9.20E-5	1.54E+0	8.06E-3			3.00E+3	3.07E-8			1.30E+4	7.08E-9			1.30E+4	7.08E-9		
	7782-49-2	Selenium and compounds	3.01E-2	4.34E-7	7.24E-3	3.80E-5													2.00E+0	1.90E-5
	108-88-3	Toluene	1.44E+0	2.08E-5	3.47E-1	1.82E-3			5.00E+3	4.15E-9			2.20E+4	9.44E-10			2.20E+4	9.44E-10	7.50E+3	2.43E-7
	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xyl	5.81E+0	8.36E-5	1.39E+0	7.32E-3			2.20E+2	3.80E-7			9.70E+2	8.62E-8			9.70E+2	8.62E-8	8.70E+3	8.41E-7
	7440-66-6	Zinc and compounds	3.07E-1	4.42E-6	7.37E-2	3.87E-4														
	7647-01-0	Hydrochloric acid	2.55E+0	3.67E-5	6.13E-1	3.22E-3			2.00E+1	1.84E-6			8.80E+1	4.17E-7			8.80E+1	4.17E-7	2.10E+3	1.53E-6
	Total REER							**4.55E-1**		**6.94E-3**		**1.50E-2**		**1.28E-3**		**2.39E-2**		**1.28E-3**		**3.75E-3**

TEU	CAS	TAC	Emissions				Residential				Non-Residential Child				Non-Residential Worker				Acute	
			Annual		Daily		Cancer		Noncancer		Cancer		Noncancer		Cancer		Noncancer			
			lb/yr	g/s	lb/day	g/s	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)
	106-99-0	1,3-Butadiene	5.05E-2	7.27E-7	4.86E-4	2.55E-6	3.30E-2	2.20E-5	2.00E+0	3.64E-7	8.60E-1	8.45E-7	8.80E+0	8.26E-8	4.00E-1	1.82E-6	8.80E+0	8.26E-8	6.60E+2	3.87E-9
	91-57-6	2-Methyl naphthalene	4.78E-4	6.88E-9	4.60E-6	2.41E-8														
	83-32-9	Acenaphthene	7.21E-4	1.04E-8	6.93E-6	3.64E-8														
	208-96-8	Acenaphthylene	2.22E-4	3.19E-9	2.13E-6	1.12E-8														
	75-07-0	Acetaldehyde	1.20E+0	1.72E-5	1.15E-2	6.04E-5	4.50E-1	3.83E-5	1.40E+2	1.23E-7	1.20E+1	1.44E-6	6.20E+2	2.78E-8	5.50E+0	3.13E-6	6.20E+2	2.78E-8	4.70E+2	1.29E-7
	107-02-8	Acrolein	1.20E+0	1.72E-5	1.15E-2	6.04E-5			3.50E-1	4.92E-5			1.50E+0	1.15E-5			1.50E+0	1.15E-5	6.90E+0	8.76E-6
	7664-41-7	Ammonia	9.90E+0	1.42E-4	9.52E-2	5.00E-4			5.00E+2	2.85E-7			2.20E+3	6.48E-8			2.20E+3	6.48E-8	1.20E+3	4.17E-7
	120-12-7	Anthracene	8.16E-5	1.17E-9	7.85E-7	4.12E-9														
	7440-38-2	Arsenic and compounds	5.46E-3	7.86E-8	5.25E-5	2.76E-7	2.40E-5	3.27E-3	1.70E-4	4.62E-4	1.30E-3	6.05E-5	2.40E-3	3.27E-5	6.20E-4	1.27E-4	2.40E-3	3.27E-5	2.00E-1	1.38E-6
	71-43-2	Benzene	1.50E-2	2.16E-7	1.44E-4	7.59E-7	1.30E-1	1.66E-6	3.00E+0	7.20E-8	3.30E+0	6.55E-8	1.30E+1	1.66E-8	1.50E+0	1.44E-7	1.30E+1	1.66E-8	2.90E+1	2.62E-8
	56-55-3	Benz[a]anthracene	4.61E-5	6.63E-10	4.43E-7	2.33E-9	2.10E-4	3.16E-6			7.80E-3	8.50E-8			1.50E-2	4.42E-8				
	50-32-8	Benzo[a]pyrene	2.58E-5	3.71E-10	2.48E-7	1.30E-9	4.30E-5	8.63E-6	2.00E-3	1.85E-7	1.60E-3	2.32E-7	8.80E-3	4.21E-8	3.00E-3	1.24E-7	8.80E-3	4.21E-8	2.00E-3	6.51E-7
	205-99-2	Benzo[b]fluoranthene	2.28E-5	3.28E-10	2.19E-7	1.15E-9	5.30E-5	6.18E-6			2.00E-3	1.64E-7			3.80E-3	8.62E-8				
	192-97-2	Benzo[e]pyrene	4.78E-5	6.88E-10	4.60E-7	2.41E-9														
	191-24-2	Benzo[g,h,i]perylene	2.90E-5	4.18E-10	2.79E-7	1.47E-9	4.70E-3	8.88E-8			1.70E-1	2.46E-9			3.40E-1	1.23E-9				
	207-08-9	Benzo[k]fluoranthene	2.84E-4	4.08E-9	2.73E-6	1.43E-8	1.40E-3	2.92E-6			5.20E-2	7.85E-8			1.00E-1	4.08E-8				
	7440-43-9	Cadmium and compounds	5.12E-3	7.37E-8	4.93E-5	2.59E-7	5.60E-4	1.32E-4	5.00E-3	1.47E-5	1.40E-2	5.26E-6	3.70E-2	1.99E-6	6.70E-3	1.10E-5	3.70E-2	1.99E-6	3.00E-2	8.62E-6
	108-90-7	Chlorobenzene	6.83E-4	9.82E-9	6.57E-6	3.45E-8			5.00E+1	1.96E-10			2.20E+2	4.47E-11			2.20E+2	4.47E-11		
	218-01-9	Chrysene	4.37E-5	6.29E-10	4.20E-7	2.21E-9	4.30E-4	1.46E-6			1.60E-2	3.93E-8			3.00E-2	2.10E-8				
	7440-50-8	Copper and compounds	1.40E-2	2.01E-7	1.35E-4	7.07E-7													1.00E+2	7.07E-9
	53-70-3	Dibenz[a,h]anthracene	2.22E-5	3.19E-10	2.13E-7	1.12E-9	4.30E-6	7.41E-5			1.60E-4	1.99E-6			3.00E-4	1.06E-6				
MFD	100-41-4	Ethyl benzene	6.83E-4	9.82E-9	6.57E-6	3.45E-8	4.00E-1	2.46E-8	2.60E+2	3.78E-11	1.00E+1	9.82E-10	1.10E+3	8.93E-12	4.80E+0	2.05E-9	1.10E+3	8.93E-12	2.20E+4	1.57E-12
	206-44-0	Fluoranthene	1.13E-4	1.63E-9	1.09E-6	5.72E-9	5.30E-4	3.08E-6			2.00E-2	8.15E-8			3.80E-2	4.29E-8				
	86-73-7	Fluorene	4.00E-4	5.75E-9	3.84E-6	2.02E-8														
	50-00-0	Formaldehyde	1.20E+0	1.72E-5	1.15E-2	6.04E-5	1.70E-1	1.01E-4	9.00E+0	1.91E-6	4.30E+0	4.01E-6	4.00E+1	4.31E-7	2.00E+0	8.61E-6	4.00E+1	4.31E-7	4.90E+1	1.23E-6
	110-54-3	Hexane	1.20E-2	1.72E-7	1.15E-4	6.03E-7			7.00E+2	2.46E-10			3.10E+3	5.55E-11			3.10E+3	5.55E-11		
	7647-01-0	Hydrochloric Acid	6.36E-1	9.15E-6	6.12E-3	3.21E-5			2.00E+1	4.58E-7			8.80E+1	1.04E-7			8.80E+1	1.04E-7	2.10E+3	1.53E-8
	18540-29-9	Chromium VI, chromate, and dichromate particulate	3.42E-4	4.91E-9	3.28E-6	1.72E-8	3.10E-5	1.58E-4	8.30E-2	5.92E-8	5.20E-4	9.45E-6	8.80E-1	5.58E-9	1.00E-3	4.91E-6	8.80E-1	5.58E-9	3.00E-1	5.75E-8
	193-39-5	Indeno[1,2,3-cd]pyrene	2.27E-5	3.26E-10	2.18E-7	1.14E-9	6.10E-4	5.35E-7			2.20E-2	1.48E-8			4.30E-2	7.59E-9				
	7439-92-1	Lead and compounds	2.83E-2	4.08E-7	2.73E-4	1.43E-6			1.50E-1	2.72E-6			6.60E-1	6.18E-7			6.60E-1	6.18E-7	1.50E-1	9.54E-6
	7439-96-5	Manganese and compounds	1.06E-2	1.52E-7	1.02E-4	5.34E-7			9.00E-2	1.69E-6			4.00E-1	3.81E-7			4.00E-1	3.81E-7	3.00E-1	1.78E-6
	7439-97-6	Mercury and compounds	6.83E-3	9.82E-8	6.57E-5	3.45E-7			7.70E-2	1.28E-6			6.30E-1	1.56E-7			6.30E-1	1.56E-7	6.00E-1	5.75E-7
	91-20-3	Naphthalene	1.81E-2	2.60E-7	1.74E-4	9.14E-7	2.90E-2	8.98E-6	3.70E+0	7.04E-8	7.60E-1	3.43E-7	1.60E+1	1.63E-8	3.50E-1	7.44E-7	1.60E+1	1.63E-8	2.00E+2	4.57E-9
	C365	Nickel compounds, insoluble	1.33E-2	1.92E-7	1.28E-4	6.72E-7	3.80E-3	5.04E-5	1.40E-2	1.37E-5	1.00E-1	1.92E-6	6.20E-2	3.09E-6	4.60E-2	4.16E-6	6.20E-2	3.09E-6	2.00E-1	3.36E-6
	198-55-0	Perylene	9.26E-5	1.33E-9	8.90E-7	4.67E-9														
	85-01-8	Phenanthrene	1.27E-3	1.83E-8	1.22E-5	6.41E-8														
	115-07-1	Propylene	3.42E-2	4.91E-7	3.28E-4	1.72E-6			3.00E+3	1.64E-10			1.30E+4	3.78E-11			1.30E+4	3.78E-11		
	129-00-0	Pyrene	1.39E-4	2.00E-9	1.34E-6	7.03E-9														
	7782-49-2	Selenium and compounds	7.51E-3	1.08E-7	7.22E-5	3.79E-7													2.00E+0	1.90E-7
	108-88-3	Toluene	1.50E-2	2.16E-7	1.44E-4	7.59E-7			5.00E+3	4.32E-11			2.20E+4	9.82E-12			2.20E+4	9.82E-12	7.50E+3	1.01E-10
	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xyl	5.46E-3	7.86E-8	5.25E-5	2.76E-7			2.20E+2	3.57E-10			9.70E+2	8.10E-11			9.70E+2	8.10E-11	8.70E+3	3.17E-11
	7440-66-6	Zinc and compounds	7.65E-2	1.10E-6	7.36E-4	3.86E-6														
		Total REER						**3.89E-3**		**5.49E-4**		**8.65E-5**		**5.13E-5**		**1.63E-4**		**5.13E-5**		**3.68E-5**

TEU	CAS	TAC	Emissions				Residential				Non-Residential Child				Non-Residential Worker				Acute	
			Annual		Daily		Cancer		Noncancer		Cancer		Noncancer		Cancer		Noncancer			
			lb/yr	g/s	lb/day	g/s	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)
	106-99-0	1,3-Butadiene	2.98E-1	4.29E-6	7.15E-2	3.75E-4	3.30E-2	1.30E-4	2.00E+0	2.14E-6	8.60E-1	4.98E-6	8.80E+0	4.87E-7	4.00E-1	1.07E-5	8.80E+0	4.87E-7	6.60E+2	5.69E-7
	75-07-0	Acetaldehyde	1.07E+0	1.54E-5	2.58E-1	1.35E-3	4.50E-1	3.43E-5	1.40E+2	1.10E-7	1.20E+1	1.29E-6	6.20E+2	2.49E-8	5.50E+0	2.81E-6	6.20E+2	2.49E-8	4.70E+2	2.88E-6
	107-02-8	Acrolein	4.65E-2	6.68E-7	1.11E-2	5.85E-5			3.50E-1	1.91E-6			1.50E+0	4.45E-7			1.50E+0	4.45E-7	6.90E+0	8.48E-6
	7664-41-7	Ammonia	3.97E+0	5.72E-5	9.54E-1	5.01E-3			5.00E+2	1.14E-7			2.20E+3	2.60E-8			2.20E+3	2.60E-8	1.20E+3	4.17E-6
	7440-38-2	Arsenic and compounds	2.19E-3	3.15E-8	5.26E-4	2.76E-6	2.40E-5	1.31E-3	1.70E-4	1.86E-4	1.30E-3	2.43E-5	2.40E-3	1.31E-5	6.20E-4	5.09E-5	2.40E-3	1.31E-5	2.00E-1	1.38E-5
	71-43-2	Benzene	2.55E-1	3.67E-6	6.13E-2	3.22E-4	1.30E-1	2.82E-5	3.00E+0	1.22E-6	3.30E+0	1.11E-6	1.30E+1	2.82E-7	1.50E+0	2.45E-6	1.30E+1	2.82E-7	2.90E+1	1.11E-5
	7440-43-9	Cadmium and compounds	2.06E-3	2.96E-8	4.93E-4	2.59E-6	5.60E-4	5.28E-5	5.00E-3	5.91E-6	1.40E-2	2.11E-6	3.70E-2	7.99E-7	6.70E-3	4.41E-6	3.70E-2	7.99E-7	3.00E-2	8.63E-5
	108-90-7	Chlorobenzene	2.74E-4	3.94E-9	6.58E-5	3.45E-7			5.00E+1	7.88E-11			2.20E+2	1.79E-11			2.20E+2	1.79E-11		
	18540-29-9	Chromium VI, chromate, and dichromate particulate	1.37E-4	1.97E-9	3.29E-5	1.73E-7	3.10E-5	6.36E-5	8.30E-2	2.37E-8	5.20E-4	3.79E-6	8.80E-1	2.24E-9	1.00E-3	1.97E-6	8.80E-1	2.24E-9	3.00E-1	5.76E-7
	7440-50-8	Copper and compounds	5.62E-3	8.08E-8	1.35E-3	7.08E-6													1.00E+2	7.08E-8
	C200	Diesel Particulate Matter	1.69E+2	2.42E-3	2.44E+1	1.28E-1	1.00E-1	2.42E-2	5.00E+0	4.85E-4	2.60E+0	9.32E-4	2.20E+1	1.10E-4	1.20E+0	2.02E-3	2.20E+1	1.10E-4		
	100-41-4	Ethyl benzene	1.49E-2	2.15E-7	3.58E-3	1.88E-5	4.00E-1	5.37E-7	2.60E+2	8.26E-10	1.00E+1	2.15E-8	1.10E+3	1.95E-10	4.80E+0	4.48E-8	1.10E+3	1.95E-10	2.20E+4	8.55E-10
	50-00-0	Formaldehyde	2.37E+0	3.40E-5	5.68E-1	2.98E-3	1.70E-1	2.00E-4	9.00E+0	3.78E-6	4.30E+0	7.91E-6	4.00E+1	8.51E-7	2.00E+0	1.70E-5	4.00E+1	8.51E-7	4.90E+1	6.08E-5
	110-54-3	Hexane	3.69E-2	5.30E-7	8.85E-3	4.64E-5			7.00E+2	7.57E-10			3.10E+3	1.71E-10			3.10E+3	1.71E-10		
	7439-92-1	Lead and compounds	1.14E-2	1.64E-7	2.73E-3	1.43E-5			1.50E-1	1.09E-6			6.60E-1	2.48E-7			6.60E-1	2.48E-7	1.50E-1	9.55E-5
	7439-96-5	Manganese and compounds	4.25E-3	6.11E-8	1.02E-3	5.35E-6			9.00E-2	6.79E-7			4.00E-1	1.53E-7			4.00E-1	1.53E-7	3.00E-1	1.78E-5
	7439-97-6	Mercury and compounds	2.74E-3	3.94E-8	6.58E-4	3.45E-6			7.70E-2	5.12E-7			6.30E-1	6.26E-8			6.30E-1	6.26E-8	6.00E-1	5.76E-6
	91-20-3	Naphthalene	2.70E-2	3.88E-7	6.48E-3	3.40E-5	2.90E-2	1.34E-5	3.70E+0	1.05E-7	7.60E-1	5.11E-7	1.60E+1	2.43E-8	3.50E-1	1.11E-6	1.60E+1	2.43E-8	2.00E+2	1.70E-7
	C365	Nickel compounds, insoluble	5.34E-3	7.69E-8	1.28E-3	6.73E-6	3.80E-3	2.02E-5	1.40E-2	5.49E-6	1.00E-1	7.69E-7	6.20E-2	1.24E-6	4.60E-2	1.67E-6	6.20E-2	1.24E-6	2.00E-1	3.37E-5
	83-32-9	Acenaphthene	4.59E-3	6.60E-8	1.10E-3	5.79E-6														
EDFP	208-96-8	Acenaphthylene	5.57E-3	8.01E-8	1.34E-3	7.02E-6														
	120-12-7	Anthracene	5.50E-3	7.92E-8	1.32E-3	6.93E-6														
	56-55-3	Benz[a]anthracene	5.35E-3	7.69E-8	1.28E-3	6.74E-6	2.10E-4	3.66E-4			7.80E-3	9.86E-6			1.50E-2	5.13E-6				
	50-32-8	Benzo[a]pyrene	4.86E-5	7.00E-10	1.17E-5	6.13E-8	4.30E-5	1.63E-5	2.00E-3	3.50E-7	1.60E-3	4.37E-7	8.80E-3	7.95E-8	3.00E-3	2.33E-7	8.80E-3	7.95E-8	2.00E-3	3.06E-5
	205-99-2	Benzo[b]fluoranthene	9.18E-3	1.32E-7	2.20E-3	1.16E-5	5.30E-5	2.49E-3			2.00E-3	6.60E-5			3.80E-3	3.47E-5				
	191-24-2	Benzo[g,h,i]perylene	3.91E-6	5.62E-11	9.37E-7	4.92E-9	4.70E-3	1.20E-8			1.70E-1	3.30E-10			3.40E-1	1.65E-10				
	207-08-9	Benzo[k]fluoranthene	9.18E-3	1.32E-7	2.20E-3	1.16E-5	1.40E-3	9.43E-5			5.20E-2	2.54E-6			1.00E-1	1.32E-6				
	218-01-9	Chrysene	4.90E-3	7.05E-8	1.18E-3	6.18E-6	4.30E-4	1.64E-4			1.60E-2	4.41E-6			3.00E-2	2.35E-6				
	53-70-3	Dibenz[a,h]anthracene	4.78E-3	6.88E-8	1.15E-3	6.03E-6	4.30E-6	1.60E-2			1.60E-4	4.30E-4			3.00E-4	2.29E-4				
	206-44-0	Fluoranthene	5.48E-3	7.88E-8	1.31E-3	6.90E-6	5.30E-4	1.49E-4			2.00E-2	3.94E-6			3.80E-2	2.07E-6				
	86-73-7	Fluorene	2.89E-2	4.16E-7	6.94E-3	3.65E-5														
	193-39-5	Indeno[1,2,3-cd]pyrene	4.74E-3	6.82E-8	1.14E-3	5.98E-6	6.10E-4	1.12E-4			2.20E-2	3.10E-6			4.30E-2	1.59E-6				
	85-01-8	Phenanthrene	5.34E-2	7.69E-7	1.28E-2	6.73E-5														
	129-00-0	Pyrene	1.15E-2	1.66E-7	2.77E-3	1.45E-5														
	115-07-1	Propylene	6.40E-1	9.20E-6	1.54E-1	8.06E-4			3.00E+3	3.07E-9			1.30E+4	7.08E-10			1.30E+4	7.08E-10		
	7782-49-2	Selenium and compounds	3.01E-3	4.34E-8	7.24E-4	3.80E-6													2.00E+0	1.90E-6
	108-88-3	Toluene	1.44E-1	2.08E-6	3.47E-2	1.82E-4			5.00E+3	4.15E-10			2.20E+4	9.44E-11			2.20E+4	9.44E-11	7.50E+3	2.43E-8
	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xyl	5.81E-1	8.36E-6	1.39E-1	7.32E-4			2.20E+2	3.80E-8			9.70E+2	8.62E-9			9.70E+2	8.62E-9	8.70E+3	8.41E-8
	7440-66-6	Zinc and compounds	3.07E-2	4.42E-7	7.37E-3	3.87E-5														
	7647-01-0	Hydrochloric acid	2.55E-1	3.67E-6	6.13E-2	3.22E-4			2.00E+1	1.84E-7			8.80E+1	4.17E-8			8.80E+1	4.17E-8	2.10E+3	1.53E-7
		Total REER						**4.55E-2**		**6.94E-4**		**1.50E-3**		**1.28E-4**		**2.39E-3**		**1.28E-4**		**3.75E-4**
LS1	7631-86-9	Silica, crystalline (respirable)	1.12E-6	1.61E-11	1.87E-7	9.82E-10			3.00E+0	5.35E-12			1.30E+1	1.24E-12			1.30E+1	1.24E-12		
		Total REER								**5.35E-12**				**1.24E-12**				**1.24E-12**		
LS2	7631-86-9	Silica, crystalline (respirable)	9.20E-6	1.32E-10	2.52E-8	1.32E-10			3.00E+0	4.41E-11			1.30E+1	1.02E-11			1.30E+1	1.02E-11		
		Total REER								**4.41E-11**				**1.02E-11**				**1.02E-11**		
	71-43-2	Benzene	3.33E+1	4.80E-4	9.13E-2	4.80E-4	1.30E-1	3.69E-3	3.00E+0	1.60E-4	3.30E+0	1.45E-4	1.30E+1	3.69E-5	1.50E+0	3.20E-4	1.30E+1	3.69E-5	2.90E+1	1.65E-5
	92-52-4	Biphenyl	1.85E-1	2.66E-6	5.07E-4	2.66E-6														
	110-82-7	Cyclohexane	4.45E+0	6.39E-5	1.22E-2	6.39E-5			6.00E+3	1.07E-8			2.60E+4	2.46E-9			2.60E+4	2.46E-9		
	100-41-4	Ethyl benzene	2.97E+1	4.28E-4	8.15E-2	4.28E-4	4.00E-1	1.07E-3	2.60E+2	1.64E-6	1.00E+1	4.28E-5	1.10E+3	3.89E-7	4.80E+0	8.91E-5	1.10E+3	3.89E-7	2.20E+4	1.94E-8
	110-54-3	Hexane	1.32E+2	1.90E-3	3.62E-1	1.90E-3			7.00E+2	2.72E-6			3.10E+3	6.13E-7			3.10E+3	6.13E-7		
TG1	91-20-3	Naphthalene	8.22E+0	1.18E-4	2.25E-2	1.18E-4	2.90E-2	4.08E-3	3.70E+0	3.20E-5	7.60E-1	1.56E-4	1.60E+1	7.39E-6	3.50E-1	3.38E-4	1.60E+1	7.39E-6	2.00E+2	5.91E-7
	108-95-2	Phenol	1.02E+0	1.47E-5	2.79E-3	1.47E-5			2.00E+2	7.33E-8			8.80E+2	1.67E-8			8.80E+2	1.67E-8	5.80E+3	2.53E-9
	108-88-3	Toluene	1.34E+2	1.92E-3	3.66E-1	1.92E-3			5.00E+3	3.84E-7			2.20E+4	8.73E-8			2.20E+4	8.73E-8	7.50E+3	2.56E-7
	95-63-6	1,2,4-Trimethylbenzene	4.63E+1	6.66E-4	1.27E-1	6.66E-4			6.00E+1	1.11E-5			2.60E+2	2.56E-6			2.60E+2	2.56E-6		
	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xyl	1.33E+2	1.91E-3	3.64E-1	1.91E-3			2.20E+2	8.68E-6			9.70E+2	1.97E-6			9.70E+2	1.97E-6	8.70E+3	2.20E-7
	98-82-8	Isopropylbenzene (Cumene)	9.26E+0	1.33E-4	2.54E-2	1.33E-4			4.00E+2	3.33E-7			1.80E+3	7.40E-8			1.80E+3	7.40E-8		
		Total REER						**8.84E-3**		**2.17E-4**		**3.44E-4**		**5.00E-5**		**7.47E-4**		**5.00E-5**		**1.76E-5**

TEU	CAS	TAC	Emissions				Residential				Non-Residential Child				Non-Residential Worker				Acute	
			Annual		Daily		Cancer		Noncancer		Cancer		Noncancer		Cancer		Noncancer			
			lb/yr	g/s	lb/day	g/s	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)	RBC µg/m³	REER (g/s)/(µg/m³)
TD1	71-43-2	Benzene	6.87E-5	9.88E-10	1.88E-7	9.88E-10	1.30E-1	7.60E-9	3.00E+0	3.29E-10	3.30E+0	2.99E-10	1.30E+1	7.60E-11	1.50E+0	6.59E-10	1.30E+1	7.60E-11	2.90E+1	3.41E-11
	92-52-4	Biphenyl	8.18E-3	1.18E-7	2.24E-5	1.18E-7														
	100-41-4	Ethyl benzene	1.06E-3	1.53E-8	2.91E-6	1.53E-8	4.00E-1	3.82E-8	2.60E+2	5.88E-11	1.00E+1	1.53E-9	1.10E+3	1.39E-11	4.80E+0	3.19E-9	1.10E+3	1.39E-11	2.20E+4	6.95E-13
	110-54-3	Hexane	8.18E-2	1.18E-6	2.24E-4	1.18E-6			7.00E+2	1.68E-9			3.10E+3	3.80E-10			3.10E+3	3.80E-10		
	91-20-3	Naphthalene	4.50E-2	6.47E-7	1.23E-4	6.47E-7	2.90E-2	2.23E-5	3.70E+0	1.75E-7	7.60E-1	8.51E-7	1.60E+1	4.04E-8	3.50E-1	1.85E-6	1.60E+1	4.04E-8	2.00E+2	3.24E-9
	85-01-8	Phenanthrene	1.02E-2	1.47E-7	2.80E-5	1.47E-7														
	108-95-2	Phenol	5.24E-3	7.53E-8	1.43E-5	7.53E-8			2.00E+2	3.76E-10			8.80E+2	8.56E-11			8.80E+2	8.56E-11	5.80E+3	1.30E-11
	100-42-5	Styrene	2.62E-3	3.76E-8	7.17E-6	3.76E-8			1.00E+3	3.76E-11			4.40E+3	8.56E-12			4.40E+3	8.56E-12	2.10E+4	1.79E-12
	108-88-3	Toluene	2.62E-3	3.76E-8	7.17E-6	3.76E-8			5.00E+3	7.53E-12			2.20E+4	1.71E-12			2.20E+4	1.71E-12	7.50E+3	5.02E-12
	95-63-6	1,2,4-Trimethylbenzene	8.18E-2	1.18E-6	2.24E-4	1.18E-6			6.00E+1	1.96E-8			2.60E+2	4.53E-9			2.60E+2	4.53E-9		
	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xyl	2.37E-2	3.41E-7	6.50E-5	3.41E-7			2.20E+2	1.55E-9			9.70E+2	3.52E-10			9.70E+2	3.52E-10	8.70E+3	3.92E-11
	7439-97-6	Mercury and compounds	3.27E-6	4.71E-11	8.96E-9	4.71E-11			7.70E-2	6.11E-10			6.30E-1	7.47E-11			6.30E-1	7.47E-11	6.00E-1	7.84E-11
		Total REER						**2.24E-5**		**1.99E-7**		**8.53E-7**		**4.60E-8**		**1.85E-6**		**4.60E-8**		**3.41E-9**
TD2	71-43-2	Benzene	7.22E-6	1.04E-10	1.98E-8	1.04E-10	1.30E-1	7.99E-10	3.00E+0	3.46E-11	3.30E+0	3.15E-11	1.30E+1	7.99E-12	1.50E+0	6.93E-11	1.30E+1	7.99E-12	2.90E+1	3.58E-12
	92-52-4	Biphenyl	8.60E-4	1.24E-8	2.36E-6	1.24E-8														
	100-41-4	Ethyl benzene	1.12E-4	1.61E-9	3.06E-7	1.61E-9	4.00E-1	4.02E-9	2.60E+2	6.18E-12	1.00E+1	1.61E-10	1.10E+3	1.46E-12	4.80E+0	3.35E-10	1.10E+3	1.46E-12	2.20E+4	7.31E-14
	110-54-3	Hexane	8.60E-3	1.24E-7	2.36E-5	1.24E-7			7.00E+2	1.77E-10			3.10E+3	3.99E-11			3.10E+3	3.99E-11		
	91-20-3	Naphthalene	4.73E-3	6.80E-8	1.30E-5	6.80E-8	2.90E-2	2.35E-6	3.70E+0	1.84E-8	7.60E-1	8.95E-8	1.60E+1	4.25E-9	3.50E-1	1.94E-7	1.60E+1	4.25E-9	2.00E+2	3.40E-10
	85-01-8	Phenanthrene	1.08E-3	1.55E-8	2.95E-6	1.55E-8														
	108-95-2	Phenol	5.50E-4	7.92E-9	1.51E-6	7.92E-9			2.00E+2	3.96E-11			8.80E+2	9.00E-12			8.80E+2	9.00E-12	5.80E+3	1.36E-12
	100-42-5	Styrene	2.75E-4	3.96E-9	7.54E-7	3.96E-9			1.00E+3	3.96E-12			4.40E+3	9.00E-13			4.40E+3	9.00E-13	2.10E+4	1.88E-13
	108-88-3	Toluene	2.75E-4	3.96E-9	7.54E-7	3.96E-9			5.00E+3	7.92E-13			2.20E+4	1.80E-13			2.20E+4	1.80E-13	7.50E+3	5.28E-13
	95-63-6	1,2,4-Trimethylbenzene	8.60E-3	1.24E-7	2.36E-5	1.24E-7			6.00E+1	2.06E-9			2.60E+2	4.76E-10			2.60E+2	4.76E-10		
	1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xyl	2.49E-3	3.59E-8	6.83E-6	3.59E-8			2.20E+2	1.63E-10			9.70E+2	3.70E-11			9.70E+2	3.70E-11	8.70E+3	4.12E-12
	7439-97-6	Mercury and compounds	3.44E-7	4.95E-12	9.42E-10	4.95E-12			7.70E-2	6.43E-11			6.30E-1	7.85E-12			6.30E-1	7.85E-12	6.00E-1	8.25E-12
		Total REER						**2.35E-6**		**2.09E-8**		**8.97E-8**		**4.83E-9**		**1.95E-7**		**4.83E-9**		**3.58E-10**

AERMOD Source	TEU REER Allocation												Modeled REER (g/s)/(µg/m³)						
													Residential		Non-Residential Child		Non-Residential Worker		Acute
	UB	UBD	UFD	UDP	MFP	MFHG	MFD	BRWBD	BRWBD	AFD	OC	BC	Cancer	Noncancer	Cancer	Noncancer	Cancer	Noncancer	
UG	100%	100%	100%	100%									3.38E+0	4.58E-2	9.94E-2	6.19E-3	1.12E-1	6.19E-3	9.36E-4
MF					100%	100%	100%						5.78E-2	8.99E-3	1.35E-3	9.10E-4	2.20E-3	9.10E-4	4.67E-4
BRWBLAST								100%	100%	30.5%			9.24E-2	1.29E-2	2.16E-3	1.16E-3	3.53E-3	1.16E-3	3.82E-5
BRW										46.9%			1.40E-1	1.98E-2	3.25E-3	1.77E-3	5.31E-3	1.77E-3	5.44E-5
WRSF										7.1%			2.13E-2	3.01E-3	4.93E-4	2.68E-4	8.07E-4	2.68E-4	8.27E-6
CRF										7.5%			2.24E-2	3.16E-3	5.18E-4	2.82E-4	8.48E-4	2.82E-4	8.69E-6
STK										6.9%			2.05E-2	2.89E-3	4.75E-4	2.58E-4	7.76E-4	2.58E-4	7.95E-6
TS1										0.8%			2.45E-3	3.46E-4	5.68E-5	3.08E-5	9.28E-5	3.08E-5	9.51E-7
TS2										0.3%			1.01E-3	1.43E-4	2.34E-5	1.27E-5	3.83E-5	1.27E-5	3.93E-7
OC1											2.3%		4.40E-3	5.94E-4	1.03E-4	4.99E-5	1.66E-4	4.99E-5	7.85E-7
OC2											2.3%		4.40E-3	5.94E-4	1.03E-4	4.99E-5	1.66E-4	4.99E-5	7.85E-7
OC3											20.0%		3.77E-2	5.09E-3	8.86E-4	4.28E-4	1.42E-3	4.28E-4	6.73E-6
OC4											2.3%		4.40E-3	5.94E-4	1.03E-4	4.99E-5	1.66E-4	4.99E-5	7.85E-7
OC5											36.7%		6.91E-2	9.33E-3	1.62E-3	7.85E-4	2.61E-3	7.85E-4	1.23E-5
OC6											2.3%		4.40E-3	5.94E-4	1.03E-4	4.99E-5	1.66E-4	4.99E-5	7.85E-7
OC7											2.3%		4.40E-3	5.94E-4	1.03E-4	4.99E-5	1.66E-4	4.99E-5	7.85E-7
OC8											20.0%		3.77E-2	5.09E-3	8.86E-4	4.28E-4	1.42E-3	4.28E-4	6.73E-6
OC9											2.3%		4.40E-3	5.94E-4	1.03E-4	4.99E-5	1.66E-4	4.99E-5	7.85E-7
OC10											2.3%		4.40E-3	5.94E-4	1.03E-4	4.99E-5	1.66E-4	4.99E-5	7.85E-7
OC11											2.3%		4.40E-3	5.94E-4	1.03E-4	4.99E-5	1.66E-4	4.99E-5	7.85E-7
OC12											2.3%		4.40E-3	5.94E-4	1.03E-4	4.99E-5	1.66E-4	4.99E-5	7.85E-7
OC13											2.3%		4.40E-3	5.94E-4	1.03E-4	4.99E-5	1.66E-4	4.99E-5	7.85E-7
BC1												5.3%	7.13E-2	9.81E-3	1.64E-3	8.33E-4	2.70E-3	8.33E-4	2.05E-5
BC2												5.3%	7.13E-2	9.81E-3	1.64E-3	8.33E-4	2.70E-3	8.33E-4	2.05E-5
BC3												9.5%	1.28E-1	1.77E-2	2.96E-3	1.50E-3	4.86E-3	1.50E-3	3.69E-5
BC4												5.3%	7.13E-2	9.81E-3	1.64E-3	8.33E-4	2.70E-3	8.33E-4	2.05E-5
BC5												5.3%	7.13E-2	9.81E-3	1.64E-3	8.33E-4	2.70E-3	8.33E-4	2.05E-5
BC6												5.3%	7.13E-2	9.81E-3	1.64E-3	8.33E-4	2.70E-3	8.33E-4	2.05E-5
BC7												44.0%	5.94E-1	8.18E-2	1.37E-2	6.95E-3	2.25E-2	6.95E-3	1.71E-4
BC8												9.5%	1.28E-1	1.77E-2	2.96E-3	1.50E-3	4.86E-3	1.50E-3	3.69E-5
BC9												5.3%	7.13E-2	9.81E-3	1.64E-3	8.33E-4	2.70E-3	8.33E-4	2.05E-5
BC10												5.3%	7.13E-2	9.81E-3	1.64E-3	8.33E-4	2.70E-3	8.33E-4	2.05E-5

AIR SCIENCES INC.

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Grassy Mountain Mine New Source Review Analysis Modeling Protocol

PREPARED FOR:
CALICO RESOURCES USA CORP.

PROJECT NO. 343-1
AUGUST 1, 2022

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Appendix A – Emissions Inventory

1.0 INTRODUCTION

Calico Resources USA Corp. (Calico) proposes constructing and operating the Grassy Mountain Mine project in Malheur County, Oregon. The project is a proposed underground gold and silver mine with on-site milling and refining operations. This New Source Review (NSR) modeling protocol presents the proposed methods to complete an air quality analysis to support Calico's application to obtain the appropriate air discharge permits for the Grassy Mountain project.

1.1 Regulatory Considerations

The Grassy Mountain location is designated as unclassified for all criteria pollutants (EM Strategies 2018), and therefore it is subject to attainment area rules. The project facility-wide potential emissions in tons per year (ton/yr) are provided in Table 1. This table also provides the applicable Significant Emission Rate (SER) in ton/yr from Oregon Administrative Rule (OAR) Chapter 340, Division 200, Section 0020, Subsection 161 (OAR 340-200-0020(161)) for each regulated pollutant. Detailed criteria pollutant emission calculations are provided in Appendix A.

Table 1. Grassy Mountain Potential Emissions (ton/yr)

Source Category	PM	PM_{10}	$PM_{2.5}$	CO	NO_X	SO_2	VOC	Pb	$PM_{2.5}$ Precursor	O_3 Precursor
Process	10.47	4.68	1.47	7.97	5.89	0.66	1.57	1.6E-4	5.89	5.89
Mining and Fugitive	38.48	10.78	1.08	10.89	1.69	0.001	--	1.3E-5	1.69	1.69
Nonroad	0.53	0.53	0.53	10.53	9.69	0.02	9.62	6.8E-4	9.69	9.69
Facility Total	**49.48**	**15.99**	3.08	29.39	17.27	0.67	11.19	8.5E-4	17.27	17.27
SER	**25**	**15**	**10**	**100**	**40**	**40**	**40**	**0.6**	**40**	**40**

Particulate matter (PM); PM less than 10/2.5 microns (PM_{10}/$PM_{2.5}$); carbon monoxide (CO); nitrogen oxides (NO_X); sulfur dioxide (SO_2); volatile organic compounds (VOC); lead (Pb)
$PM_{2.5}$ precursor represents the higher of NO_X and SO_2 emissions; ozone (O_3) precursor represents the higher of NO_X and VOC emissions.

As shown in Table 1, the facility-wide potential emissions exceed the SER for PM and PM_{10} (bold values under Facility Total). Therefore, the project is designated as a state major source for these pollutants and is required to obtain a Standard Air Contaminant Discharge Permit (ACDP) per OAR 340-216-8010, Part C.

This table also shows that the facility-wide potential emissions are less than the applicable Title V (100 ton/yr per pollutant) and Prevention of Significant Deterioration (PSD) Major Source (250 ton/yr per pollutant) thresholds. Therefore, the Grassy Mountain facility is designated as a minor source for Title V and the PSD determinations.

Based on the Grassy Mountain location, source classification, and potential emissions, it is subject to the Type B State NSR per OAR 340-224-0010(2)(b) for PM_{10}.

The Grassy Mountain project is also subject to the Cleaner Air Oregon (CAO) program. In July 2022, Calico submitted an Air Quality Modeling Protocol and Risk Assessment Work Plan (Air Sciences 2022) (CAO protocol) to the Oregon Department of Environmental Quality (DEQ). The CAO protocol provides details of the proposed CAO risk assessment methods, including the air dispersion modeling methodology and datasets. This NSR modeling protocol provides the additional elements specific to an NSR modeling protocol. Per DEQ's request (DEQ 2021b), this document shall reference the CAO protocol when addressing general modeling elements common to both CAO and NSR analyses and these shall not be reproduced in this document.

1.2 Project Description

See Section 1.1 of the CAO protocol (Air Sciences 2022).

1.3 Site Characteristics

The Grassy Mountain deposit is situated near the western edge of the Snake River Plain in the semi-arid high desert plateau region in eastern Oregon. The average annual precipitation in the area is approximately 229 millimeters. The terrain is mainly an open steppe with mesas, broad valleys, and gently rolling hills leading to steeper uplands. Elevations range from 1,006 to 1,311 meters above mean sea level. Vegetation consists of sagebrush, weeds, and desert grasses tolerant of semi-arid conditions (Ausenco 2020).

The facility location maps and plot plans, including building views, are provided as Figures 1–4 of the CAO protocol (Air Sciences 2022).

2.0 NSR MODELING METHODS

2.1 Model Selection

See Section 2.1 of the CAO protocol (Air Sciences 2022). A more recent version of AERMOD (22112) will be used for the analysis.

2.2 Modeled Sources

See Section 2.2 of the CAO protocol (Air Sciences 2022). Haul road fugitive dust will be included as a source for NSR modeling.

2.3 Source Characterization and Model Input Parameters

See Section 2.3 of the CAO protocol (Air Sciences 2022).

2.4 Insignificant Sources

See Section 2.4 of the CAO protocol (Air Sciences 2022).

2.5 Coordinate System

See Section 2.5 of the CAO protocol (Air Sciences 2022).

2.6 Building Downwash

See Section 2.6 of the CAO protocol (Air Sciences 2022).

2.7 Receptors

See Section 2.7, Figure 5, and Section 3.2.2 of the CAO protocol (Air Sciences 2022).

2.8 Meteorological Data

See Section 2.8, Figure 6, and Figure 7 of the CAO protocol (Air Sciences 2022). A more recent version of AERMET (22112) will be used for the data processing.

2.9 Background Concentrations

Monitored pollutant concentrations—termed background or baseline concentrations—represent prevailing air pollution from existing sources in the region. These concentrations are added to the modeled ambient concentrations from a project's emissions to estimate the total ambient concentrations at the modeled receptors.

Calico contracted HDR, Inc. and Bison Engineering, Inc. to design, install, and operate an on-site particulate ($PM_{2.5}$ and PM_{10}) monitoring station in 2014. This on-site station collected ambient particulate concentration data from July 2014 to September 2015 to establish background concentrations for the Grassy Mountain project. The particulate monitoring program details and data analysis are provided in "Air Quality Resources Baseline Report for

the Grassy Mountain Mine Project" (EM Strategies 2018). The on-site $PM_{2.5}$ and PM_{10} design background concentrations in micrograms per cubic meter ($\mu g/m^3$) are provided in Table 2 and will be used in the cumulative impact analysis.

Table 2. Grassy Mountain On-site Particulate Background Concentrations

Pollutant	Averaging Time	Form	Background Concentration ($\mu g/m^3$)	Data Period
$PM_{2.5}$	Annual	Average	4.6	October 2014–September 2015 (excluding data affected by wildfire smoke)
	24 hours	Second high	21	
PM_{10}	24 hours	Second high	23	

Source: (EM Strategies 2018)

For criteria pollutants with no on-site background data, DEQ recommends using the gridded background concentration values available through the NW-AIRQUEST online. The gridded NW-AIRQUEST background concentrations for the Grassy Mountain location are provided in Table 3; values for particulate matter were included for reference, at the request of DEQ, but will not be used in the cumulative impact analysis.[a]

Table 3. NW-AIRQUEST Design Background Concentrations for Grassy Mountain Location

Longitude (°)	Latitude (°)	CO (ppm)		NO_2 (ppb)		O_3	$PM_{2.5}$ ($\mu g/m^3$)		PM_{10} ($\mu g/m^3$)	SO_2 (ppb)		
		8 hr	1 hr	An	1 hr	8 hr	An	24 hr	24 hr	24 hr	3 hr	1 hr
-117.396	43.653	0.948	1.45	0.469	2.62	60.69	3.83	15.85	90.92	2.41	6.39	4.66
-117.394	43.690	0.949	1.46	0.469	2.62	60.69	3.83	15.45	90.18	2.41	6.39	4.66
-117.345	43.651	0.950	1.47	0.470	2.62	60.71	3.82	15.88	85.35	2.42	6.39	4.66
-117.343	43.688	0.950	1.46	0.469	2.94	60.71	4.04	16.39	87.38	2.42	6.39	4.66
Average		0.949	1.46	0.469	2.70	60.70	3.88	15.89	88.46	2.42	6.39	4.66

Degrees (°); parts per million (ppm); nitrogen dioxide (NO_2); parts per billion (ppb); hour(s) (hr); annual (An)

[a] https://idahodeq.maps.arcgis.com/apps/MapSeries/index.html?appid=0c8a006e11fe4ec5939804b873098dfe

2.10 Pollutants and Averaging Times

As discussed in Section 1.1, Grassy Mountain's potential air emissions trigger the Type B State NSR air quality analysis for PM_{10}. Additionally, DEQ guidance (DEQ 2022a) requires that all new facilities applying for a Simple or Standard ACDP must compare short-term emission rates with the Trial Significant Emission Thresholds (SETs) for the following short-term National Ambient Air Quality Standards (NAAQS):

1. NO_2 1 hour
2. $PM_{2.5}$ 24 hours
3. SO_2 1 hour

If the short-term emission rate is at or above the associated SET, the facility should demonstration compliance with the NAAQS using dispersion modeling. The short-term emission rates for Grassy Mountain and their comparison with the SETs are provided in Table 4.

Table 4. Grassy Mountain Short-Term Emission Rates

Source Category	24-hour $PM_{2.5}$ (lb/day)	1-hour NO_X (lb/hr)	1-hour SO_2 (lb/hr)
Process	18.5	31.06	0.46
Mining and Fugitive	10.0	5.38	0.01
Nonroad (Underground)	5.1	3.88	0.01
Facility Total	**33.6**	**40.32**	0.48
SET	**5**	**3**	**3**

Grassy Mountain emissions exceed the SETs for 24-hour $PM_{2.5}$ and 1-hour NO_X (bold values under Facility Total). Therefore, the proposed Type B NSR air quality analysis for Grassy Mountain will include evaluation of these pollutant and averaging times in addition to 24-hour PM_{10}. The pollutant and averaging time combinations, which will be included in the analysis, are provided in Table 5.

Table 5. Modeled Pollutants and Averaging Times

Pollutant	Averaging Time	Form
NO_2	1 hour	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
$PM_{2.5}$	24 hours	98th percentile, averaged over 3 years
PM_{10}	24 hours	Not to be exceeded more than once per year on average over 3 years

2.11 Modeling Options

Default regulatory modeling options for AERMOD will be used to estimate the specific design concentrations for each pollutant and averaging time at the modeled receptor locations.

2.11.1 Conversion of NO_X to NO_2

The Ambient Ratio Method 2 (ARM2) will be used for modeling the NO_X to NO_2 conversion for the proposed Grassy Mountain air quality analysis. It is a Tier 2 approach recommended by the Environmental Protection Agency (EPA) Guideline on Air Quality Models, Appendix W to Code of Federal Regulations, Title 40, Part 51.

2.11.2 Treatment of Intermittent Emissions for 1-Hour Analyses

In its guidance on NO_2 and SO_2 1-hour modeling (EPA 2011), the EPA has recognized that intermittent sources that do not operate continuously or frequently enough—specifically, emergency generators—are less likely to contribute significantly to the annual distribution of daily maximum 1-hour values. The EPA recommends "*that compliance demonstrations for the 1-hour NO_2 NAAQS be based on emission scenarios that can logically be assumed to be relatively continuous or which occur frequently enough to contribute significantly to the annual distribution of daily maximum 1-hour concentrations*" (EPA 2011).

The proposed emergency equipment at the Grassy Mountain project includes a diesel-powered emergency generator to supply power to critical operations in an event of power failure, and a fire water pump. The potential to emit for the emergency equipment is determined using the 100 hours per year allowed by the applicable regulations for maintenance and readiness testing. Emissions from the emergency engines will be modeled with average hourly rates rather than the maximum hourly emissions for the 1-hour analyses. This is consistent with the EPA guidance for intermittent sources (EPA 2011).

Blasting will occur at the borrow site (a basalt rock quarry) to produce material for backfill operations. When a blast in the borrow occurs, activity near the blasting area will necessarily cease. This means that no other sources of NO_2 will be active near the blast area. Based on a decision by DEQ, the EPA guidance for intermittent sources is also applicable to the borrow blasting activities (DEQ 2022b). DEQ considered the following: blasting will be performed on an as-needed basis to produce the rock; the agency's experience with Monte Carlo analyses for this type of activity; and the project's remote location. Therefore, the emissions from the blasting will be modeled with an average hourly emission rate rather than the maximum hourly emission rate for the NO_2 1-hour modeling analyses. This is consistent with EPA guidance for intermittent sources (EPA 2011).

2.12 Modeling Scope

Typically, the scope of an NSR air quality modeling analysis is determined by comparing the single-source modeled concentrations with the applicable Significant Impact Levels (SIL). Modeling the Grassy Mountain project emissions are reasonably expected to result in concentrations higher than the SILs, so the single source impact step will be bypassed in favor of completing the NAAQS Cumulative Impact Analysis.

2.13 NAAQS Cumulative Impact Analysis

The proposed NSR air quality analysis will include AERMOD dispersion modeling to demonstrate compliance with the NAAQS provided in Table 6.

Table 6. NAAQS for Compliance Demonstration

Pollutant	Averaging Time	NAAQS		Form
		(ppb)	(µg/m³)	
NO_2	1 hour	100	188	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
$PM_{2.5}$	24 hours	--	35	98th percentile, averaged over 3 years
PM_{10}	24 hours	--	150	Not to be exceeded more than once per year on average over 3 years

The AERMOD dispersion modeling for the Grassy Mountain NAAQS cumulative impact analysis will include emissions from the Grassy Mountain sources and the significant competing sources in the project area. A significant competing source inventory will be obtained from DEQ.

Design background concentrations will be added to the highest modeled cumulative design concentrations to estimate total cumulative concentrations. Total cumulative concentrations will be compared with NAAQS for compliance demonstration. The proposed design background concentrations are provided in Table 7.

Table 7. Proposed Background Concentrations

Pollutant	Averaging Time	Background Concentration		Reference
		(ppb)	(µg/m³)	
NO_2	1 hour	2.70	5	NW-AIRQUEST average, Table 3
$PM_{2.5}$	24 hours	--	21	On-site, Table 2
PM_{10}	24 hours	--	23	On-site, Table 2

2.14 Modeled Emission Rates for Precursors (MERPs) Analysis

Unlike the other criteria pollutants, ground-level O_3 is not directly emitted from industrial sources; it is a secondary pollutant formed through photochemical reactions driven predominantly by the emissions of NO_X and VOC in the presence of sunlight. O_3 formation is a complicated, nonlinear process that depends on meteorological conditions in addition to NO_X and VOC concentrations. Warm temperatures, clear skies (i.e., abundant levels of solar radiation), and stagnant air masses (low wind speeds) increase the potential for O_3 formation (EPA 2016).

The O_3 impacts from the Grassy Mountain project's potential O_3 precursor emissions will be evaluated using the Tier 1 approach provided in EPA's single-source O_3 and secondary $PM_{2.5}$ guidance (EPA 2016). This approach involves estimating the O_3 concentration resulting from the Grassy Mountain project's potential O_3 precursor emissions via the scaling of representative hypothetical source (RHS) precursor emissions and corresponding resultant O_3 concentrations as follows:

$$Grassy\ Mountain\ O_3\ 8-Hour\ Maximum\ Impact$$
$$= \frac{RHS\ O_3\ 8-Hour\ Maximum\ Impact\ (from\ NO_X) \times Grassy\ Mountain\ NO_X\ Emissions}{RHS\ NO_X\ Emissions}$$
$$+ \frac{RHS\ O_3\ 8-Hour\ Maximum\ Impact\ (from\ VOC) \times Grassy\ Mountain\ VOC\ Emissions}{RHS\ VOC\ Emissions}$$

The proposed MERPs Tier 1 analysis for the Grassy Mountain project will use the Morrow site near Arlington on the Columbia River as an RHS. The Morrow site is considered the most conservative RHS for MERPs Tier 1 analysis in Oregon by DEQ (DEQ 2022a).

Like O_3, $PM_{2.5}$ can be formed indirectly as a result of NOx and SO_2 emissions interacting with other chemicals in the downwind atmosphere to form fine particles. Direct $PM_{2.5}$ concentrations from the Grassy Mountain project $PM_{2.5}$ emissions will be estimated using AERMOD as described in this protocol. To evaluate the secondary $PM_{2.5}$ impacts from the $PM_{2.5}$ precursor emissions, a Tier 1 assessment similar to the O_3 Tier 1 assessment will be performed using the following equations:

$$Grassy\ Mountain\ PM_{2.5}\ \ 24-Hour\ Maximum\ Impact$$
$$= \frac{RHS\ PM_{2.5}\ 24-Hour\ Maximum\ Impact\ (from\ NO_X) \times Grassy\ Mountain\ NO_X\ Emissions}{RHS\ NO_X\ Emissions}$$
$$+ \frac{RHS\ PM_{2.5}\ 24-Hour\ Maximum\ Impact\ (from\ SO_2) \times Grassy\ Mountain\ SO_2\ Emissions}{RHS\ SO_2\ Emissions}$$

$$Grassy\ Mountain\ PM_{2.5}\ \ Annual\ Maximum\ Impact$$
$$= \frac{RHS\ PM_{2.5}\ Annual\ Maximum\ Impact\ (from\ NO_X) \times Grassy\ Mountain\ NO_X\ Emissions}{RHS\ NO_X\ Emissions}$$
$$+ \frac{RHS\ PM_{2.5}\ Annual\ Maximum\ Impact\ (from\ SO_2) \times Grassy\ Mountain\ SO_2\ Emissions}{RHS\ SO_2\ Emissions}$$

The applicable existing $PM_{2.5}$ ambient background concentrations and the primary $PM_{2.5}$ concentrations will be added to the estimated secondary $PM_{2.5}$ impacts to calculate the total $PM_{2.5}$ concentrations for comparison with the $PM_{2.5}$ 24-hour NAAQS and increment.

2.15 PSD Increment Cumulative Analysis

All sources located in Class II areas are required to perform an air quality analysis for Class II PSD Increments (DEQ 2022a). The proposed modeling for the Grassy Mountain cumulative Class II PSD Increment analysis will include the Grassy Mountain project's potential emissions along with actual emissions from the nearby permitted sources based on the competing source inventory obtained from DEQ. Additionally, Grassy Mountain project's estimated secondary impact, as described in Section 2.14, will be added to the primary impact for the $PM_{2.5}$ 24-hour PSD increment analysis.

The proposed Class II air quality analysis will include AERMOD dispersion modeling to demonstrate compliance with the PSD Increments (OAR 340-202-0210(1)(b)) provided in Table 8.

Table 8. Class II PSD Increments for Compliance Demonstration

Pollutant	Averaging Time	PSD Increment (μg/m³)	Form
$PM_{2.5}$	24 hours	9	Second High
PM_{10}	Annual	17	Second High
	24 hours	30	Second High

2.16 Analysis of Class I Area Impacts

The DEQ modeling guidance (DEQ 2022a) recommends that all sources within 200 kilometers (km) of a Class I area provide an air quality analysis for Class I PSD increments. The Grassy Mountain project location with reference to Class I areas in the region is presented in Figure 1.

This figure shows that the closest Class I area to the Grassy Mountain project is the Strawberry Mountain Wilderness, approximately 120 km to the northwest. A Class I screening (emissions over distance, i.e., Q/D) analysis following the Federal Land Managers' Air Quality Related Values Work Group guidance (NPS 2010) will be provided for the Strawberry Mountain Wilderness Class I area.

2.17 Additional Impact Analysis

Additional impacts on Class II areas will be addressed per guidance provided in the DEQ modeling guidance (DEQ 2021b). This analysis will qualitatively discuss the project's potential impacts on soils, vegetation, and visibility.

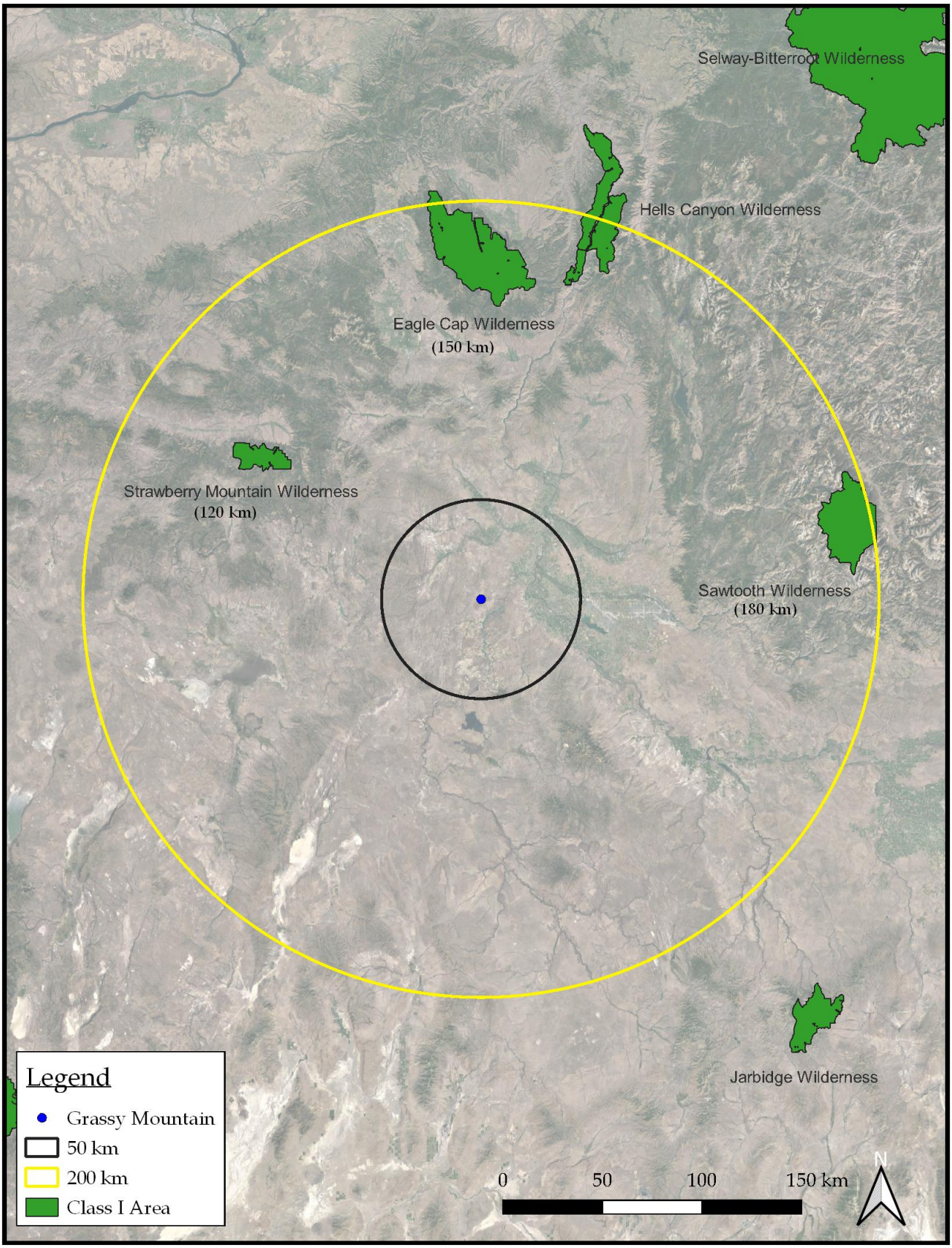
2.18 Environmental Justice Analysis

Environmental justice analysis will be provided per guidance provided in the DEQ modeling guidance (DEQ 2021b). This analysis will address the potential social and community impacts considered and evaluated for the project.

2.19 Reporting of NSR Results

The Grassy Mountain NSR air quality analysis results will be presented with the aid of tables and figures. Digital copies of the modeling files are provided via a downloadable link listed in Appendix A of the NSR Analysis Modeling Report (Air Sciences, 2022).

Figure 1. Class I Areas and Grassy Mountain Project



3.0 REFERENCES

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Appendix A – Emissions Inventory

EMISSIONS INVENTORY TABLE OF CONTENTS

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Nonroad Activity - Criteria Pollutant Emissions A-29
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Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: M. Mavko
	PROJECT NO: 343-1	PAGE: 1 OF: 1 SHEET: Summary
AIR EMISSION CALCULATIONS	SUBJECT: Summary	DATE: July 18, 2022

Facility-Wide Emissions

	chk	chk	chk	chk	chk	chk
	PM10	**PM2.5**	**CO**	**NOX**	**SO2**	**VOC**
Activity	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr
Process	4.7	1.5	8.0	5.9	0.656	1.6
Mine	10.8	1.1	10.9	1.7	0.001	--
Nonroad	0.5	0.5	10.5	9.7	0.017	9.6
Total	16.0	3.1	29.4	17.3	0.674	11.2

Short-Term Facility-Wide Emissions

	chk	chk	chk	chk	chk
	PM10	**PM2.5**	**CO**	**NOX**	**SO2**
Activity	lb/day	lb/day	lb/hr	lb/hr	lb/hr
Process	43.5	18.5	18.6	31.1	0.46
Mine	100.9	10.0	179.3	5.4	0.01
Nonroad	5.1	5.1	4.2	3.9	0.01
Total	149.5	33.6	202.2	40.3	0.48

Facility-Wide Emissions - HAP & GHG

	chk	chk
	HAP	**GHG**
Activity	ton/yr	ton/yr
Process	4.31	4,474
Mine	0.57	--
Nonroad	3.34	1,840
Tanks	0.27	--
HCN	1.93	--
Total	10.42	6,313

SOURCE DESCRIPTION		OPERATING LIMITS							EMISSION FACTORS								
Model ID	Source Description	Design Throughput unit/hr	unit/day	unit/yr	units	Material	hr/yr	reference	PM	PM_{10}	$PM_{2.5}$	CO	NOx	SO_2	VOC	unit	reference
OC1	Dump of Ore to ROM Hopper	34	816	297,840	ton	Ore	8,760	*(Ausenco 2020) p. 223*	0.00014	0.000046	0.000013					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. transfer - ctrl.
OC2	Hopper to Vibrating Pan Feeder	34	816	297,840	ton	Ore	8,760	*(Ausenco 2020) p. 223*	0.00014	0.000046	0.000013					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. transfer - ctrl.
OC3	Primary Crusher (including transfers in and out)	34	*816*	297,840	ton	Ore	8,760	*(Ausenco 2020) p. 223*	0.0012	0.00054	0.0001					lb/ton	AP-42, Table 11.19.2-2 (08/04) Tert. Crushing - ctrl.
OC4	Primary Crusher Discharge Conveyor Transfer to Screen Feed Conveyor	34	816	297,840	ton	Ore	8,760	*(Ausenco 2020) p. 223*	0.00014	0.000046	0.000013					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. transfer - ctrl.
OC5	Ore Screen (including transfers in and out)	34	816	297,840	ton	Ore	8,760	*(Ausenco 2020) p. 223*	0.0022	0.00074	0.00005					lb/ton	AP-42, Table 11.19.2-2 (08/04) Screening - ctrl.
OC6	Transfer to Secondary Crusher Surge Bin	34	816	297,840	ton	Ore	8,760	*(Ausenco 2020) p. 223*	0.00014	0.000046	0.000013					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. transfer - ctrl.
OC7	Secondary Crusher Surge Bin to Secondary Crusher Vibrating Feeder	34	816	297,840	ton	Ore	8,760	*(Ausenco 2020) p. 223*	0.00014	0.000046	0.000013					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. transfer - ctrl.
OC8	Secondary Crusher (including transfers in and out)	34	816	297,840	ton	Ore	8,760	*(Ausenco 2020) p. 223*	0.0012	0.00054	0.0001					lb/ton	AP-42, Table 11.19.2-2 (08/04) Tert. Crushing - ctrl.
OC9	Secondary Crusher Discharge Conveyor Transfer to Screen Feed Conveyor	34	816	297,840	ton	Ore	8,760	*(Ausenco 2020) p. 223*	0.00014	0.000046	0.000013					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. transfer - ctrl.
OC10	Screen Discharge Conveyor Transfer to Product Conveyor	34	816	297,840	ton	Ore	8,760	*(Ausenco 2020) p. 223*	0.00014	0.000046	0.000013					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. transfer - ctrl.
OC11	Product Conveyor Transfer to Fine Ore Bin	34	816	297,840	ton	Ore	8,760	*(Ausenco 2020) p. 223*	0.00014	0.000046	0.000013					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. transfer - ctrl.
OC12	Fine Ore Bin Discharge Feeder to Ball Mill Feed Conveyor	34	816	297,840	ton	Ore	8,760	*(Ausenco 2020) p. 223*	0.00014	0.000046	0.000013					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. transfer - ctrl.
OC13	Ball Mill Feed Conveyor to Ball Mill Transfer	34	816	297,840	ton	Ore	8,760	*(Ausenco 2020) p. 223*	0.00014	0.000046	0.000013					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. transfer - ctrl.
BC1	Dump of Borrow to Surge Bin	79	950	247,000	ton	Borrow	3,120	*(MDA 2018) pp. 178-180*	0.003	0.0011	0.00017					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. Xfer - unctrl.; PM2.5 Ch. 13.2.4
BC2	Surge Bin to Vibrating Grizzly Transfer	79	950	247,000	ton	Borrow	3,120	*(MDA 2018) pp. 178-180*	0.003	0.0011	0.00017					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. Xfer - unctrl.; PM2.5 Ch. 13.2.4
BC3	Primary Crusher (including transfers in and out)	79	950	247,000	ton	Borrow	3,120	*(MDA 2018) pp. 178-180*	0.0054	0.0024	0.00036					lb/ton	AP-42, Table 11.19.2-2 (08/04) Tert. Crushing - unctrl.; PM2.5 Ch. 13.2.4
BC4	Crusher Discharge Conveyor Transfer Point	79	950	247,000	ton	Borrow	3,120	*(MDA 2018) pp. 178-180*	0.003	0.0011	0.00017					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. Xfer - unctrl.; PM2.5 Ch. 13.2.4
BC5	Screen Feed Conveyor 1 Transfer Point	79	950	247,000	ton	Borrow	3,120	*(MDA 2018) pp. 178-180*	0.003	0.0011	0.00017					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. Xfer - unctrl.; PM2.5 Ch. 13.2.4
BC6	Screen Feed Conveyor 2 Transfer Point	79	950	247,000	ton	Borrow	3,120	*(MDA 2018) pp. 178-180*	0.003	0.0011	0.00017					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. Xfer - unctrl.; PM2.5 Ch. 13.2.4
BC7	Screen (including transfers in and out)	79	950	247,000	ton	Borrow	3,120	*(MDA 2018) pp. 178-180*	0.025	0.0087	0.00132					lb/ton	AP-42, Table 11.19.2-2 (08/04) Screening - unctrl.; PM2.5 Ch. 13.2.4
BC8	Cone Crusher (including transfers in and out)	79	950	247,000	ton	Borrow	3,120	*(MDA 2018) pp. 178-180*	0.0054	0.0024	0.00036					lb/ton	AP-42, Table 11.19.2-2 (08/04) Tert. Crushing - unctrl.; PM2.5 Ch. 13.2.4
BC9	Screen Discharge Conveyor Transfer to Stockpile Conveyor	79	950	247,000	ton	Borrow	3,120	*(MDA 2018) pp. 178-180*	0.003	0.0011	0.00017					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. Xfer - unctrl.; PM2.5 Ch. 13.2.4
BC10	Ore Stockpile Conveyor Transfer to Borrow Stockpile	79	950	247,000	ton	Borrow	3,120	*(MDA 2018) pp. 178-180*	0.003	0.0011	0.00017					lb/ton	AP-42, Table 11.19.2-2 (08/04) Conv. Xfer - unctrl.; PM2.5 Ch. 13.2.4
WM1	Wet Milling	34	816	297,840	ton	Ore	8,760	*(MDA 2018) pp. 178-180*									
LS1	Lime Silo Loading	55	55	329	ton	Lime	8,760	*(Mills 2019.06.21)*	0.00099	0.00034	0.00005					lb/ton	AP-42, Table 11.12-2 (6/06), pneumatic loading-ctrl.
LS2	Lime Silo Unloading to Lime Slaker	0.038	0.9	329	ton	Lime	8,760	*(Mills 2019.03.20)*	0.0048	0.0028	0.0004					lb/ton	AP-42, Table 11.12-2 (6/06), weigh hopper loading-unctrl.
CKD	Carbon Regeneration Kiln (Drum)	0.2	4.8	1,752	ton	Carbon	8,760	*(Mills 2019.03.20)*	0.06	0.06	0.06	1.05				lb/hr	Based on NDEP-BAPC Permit for Carbon Regeneration Kiln [Marigold (NDEP 2018)]
CKB	Carbon Regeneration Kiln (Burners)				NA	Electric	8,760	*(Ausenco 2021.11.03)*									Kiln was updated from being propane-powered to electric.
EW	Electrowinning Cells & Pregnant Solution Tank						8,760										Hg and HCN emissions only

SOURCE DESCRIPTION		OPERATING LIMITS							EMISSION FACTORS								
Model ID	Source Description	Design Throughput unit/hr	unit/day	unit/yr	units	Material	hr/yr	reference	PM	PM_{10}	$PM_{2.5}$	CO	NOx	SO_2	VOC	unit	reference
MR	Mercury Retort			21	ton	Wet Au Conc	8,760	*(MDA 2018) p. 174 (4x Au+Ag)*									Hg emissions only
MF	Melting Furnace	0.60	4.5	467.9	MMBtu	Diesel	780	*(Ausenco 2021.11.15)*	0.66	0.66	0.66	0.036	0.146	0.518	0.002	PM: lb/hr, Comb. Pol.: lb/MMBtu	PM: 40 CFR Part 60, Subpart LL (metallic mineral processing),provides a conservative estimate for baghouse EFs; Comb. Pol.: (ODEQ 2011)
LABSP	Sample Preparation	0.75	6	2,190	ton	Samples	8,760	*(Mills 2019.03.29) 100x of est.*	0.0200	0.007716	0.000738					lb/ton	AP-42, Table 11.19.2-2 (08/04), 6 splitters, 3 crushers, 3, screens, 3 pulverizers - ctrl
LABFA	Fire Assay	0.003125	0.025	9	ton	Samples	8,760	*(Mills 2019.03.29)*	20	20	20					lb/ton	AP-42 Tab. 12.7-2, Zinc smelting, Electric retort furnace
EDG1	Emergency Generator (Mfr. Yr. >2007; diesel)	2000	2000	200,000	kW	Diesel	100	*(ICB 2021)*	0.0004	0.0004	0.0004	0.00772	0.01411	1.45E-05	0.00287	lb/kW-hr	40 CFR Subpart 60.4202(a)(2); SO2 - mass balance (15 ppm ULSD) (CFR 2018b)
EDFP	Emergency Diesel Fire Pump	200	200	20,000	kW	Diesel	100	*Typical iindustry unit*	0.0004	0.0004	0.0004	0.00772	0.00882	1.45E-05	0.008818	lb/kW-hr	Table 4 to Subpart IIII of Part 60 -- 130≤KW<225 SO2 - mass balance (15ppm ULSD)
HA	Administration HVAC	1.00	24.00	8,760	MMBtu	Propane	8,760	*Standard industry size*	0.00765	0.00765	0.00765	0.0820	0.142	0.01738	0.00874	lb/MMBtu	AP-42, Table 1.5-1 (07/08) Com. Boilers; SO2 - 15.9 gr/100ft^3 & 91,500 Btu/gal
HPO	Plant Office and Dry HVAC	1.00	24.00	8,760	MMBtu	Propane	8,760	*Standard industry size*	0.00765	0.00765	0.00765	0.0820	0.142	0.01738	0.00874	lb/MMBtu	AP-42, Table 1.5-1 (07/08) Com. Boilers; SO2 - 15.9 gr/100ft^3 & 91,500 Btu/gal
HL	Laboratory HVAC	1.00	24.00	8,760	MMBtu	Propane	8,760	*Standard industry size*	0.00765	0.00765	0.00765	0.0820	0.142	0.01738	0.00874	lb/MMBtu	AP-42, Table 1.5-1 (07/08) Com. Boilers; SO2 - 15.9 gr/100ft^3 & 91,500 Btu/gal
HWW	Plant Workshop and Warehouse HVAC	1.00	24.00	8,760	MMBtu	Propane	8,760	*Standard industry size*	0.00765	0.00765	0.00765	0.0820	0.142	0.01738	0.00874	lb/MMBtu	AP-42, Table 1.5-1 (07/08) Com. Boilers; SO2 - 15.9 gr/100ft^3 & 91,500 Btu/gal
HTW	Truck Workshop and Warehouse HVAC	2.00	48.00	17,520	MMBtu	Propane	8,760	*Standard industry size*	0.00765	0.00765	0.00765	0.0820	0.142	0.01738	0.00874	lb/MMBtu	AP-42, Table 1.5-1 (07/08) Com. Boilers; SO2 - 15.9 gr/100ft^3 & 91,500 Btu/gal
HMO	Mine Office and Changehouse HVAC	1.00	24.00	8,760	MMBtu	Propane	8,760	*Standard industry size*	0.00765	0.00765	0.00765	0.0820	0.142	0.01738	0.00874	lb/MMBtu	AP-42, Table 1.5-1 (07/08) Com. Boilers; SO2 - 15.9 gr/100ft^3 & 91,500 Btu/gal
CEM1	Cement/Shotcrete loading to silo	80	80	18,742	ton	Cement	8,760	*(Dyer 2019.06.24)*	0.00099	0.00034	0.00005					lb/ton	AP-42, Table 11.12-2 (6/06), pneumatic loading-ctrl.
CEM2	Cement/Shotcrete unloading to batch plant	80	80	18,742	ton	Cement	8,760	*(Dyer 2019.06.24)*	0.00099	0.00034	0.00005					lb/ton	AP-42, Table 11.12-2 (6/06), pneumatic loading-ctrl.
CEM3	Aggregate transfer	141	1,125	249,000	ton	Aggregate	8,760	*(Ausenco 2020) p. 27 & (Dyer 2019.06.24)*	0.0069	0.0033	0.0005					lb/ton	AP-42, Table 11.12-2 (6/06), aggregate transfer-unctrl.
CEM4	Weigh hopper loading	141	1,125	249,000	ton	Aggregate	8,760	*(Ausenco 2020) p. 27 & (Dyer 2019.06.24)*	0.0048	0.0028	0.0004					lb/ton	AP-42, Table 11.12-2 (6/06), weigh hopper loading-unctrl.
CEM5	Mixer loading (central mix)	10.61 (475)	84.88	18,742 (131k)	ton	Cemented Rock Fill	8,760		0.0184	0.0055	0.0008					lb/ton	AP-42, Table 11.12-2 (6/06), central mixer-ctrl.
TG1	Mine Site Gasoline Tank #1			120,000	gal	Gasoline	8,760	*Based on 1 turnover/month*							0.211	lb/hr	EPA Tanks 4.0.9d (DSS 2019)
TD1	Mine Site Diesel Tank #1			240,000	gal	Diesel	8,760	*(McDonald et al. 2003)*							9.3E-4	lb/hr	EPA Tanks 4.0.9d (DSS 2019)
TD2	Mine Site Diesel Tank #2			15,000	gal	Diesel	8,760	*Based on 100 hr/yr of emer. gen. oper.*							9.8E-5	lb/hr	EPA Tanks 4.0.9d (DSS 2019)
Total																	

SOURCE DESCRIPTION		EMISSION CONTROLS		HOURLY EMISSIONS							DAILY EMISSIONS							ANNUAL EMISSIONS						
Model ID	Source Description	control system	efficiency reference	PM lb/hr	PM_{10} lb/hr	$PM_{2.5}$ lb/hr	CO lb/hr	NOx lb/hr	SO_2 lb/hr	VOC lb/hr	PM lb/day	PM_{10} lb/day	$PM_{2.5}$ lb/day	CO lb/day	NOx lb/day	SO_2 lb/day	VOC lb/day	PM ton/yr	PM_{10} ton/yr	$PM_{2.5}$ ton/yr	CO ton/yr	NOx ton/yr	SO_2 ton/yr	VOC ton/yr
OC1	Dump of Ore to ROM Hopper	Underground wet ore	Moisture > 0.55%-2.88% range in AP-42 Table 11.19.2-2	0.0048	0.0016	4.4E-4					0.11	0.038	0.011					0.021	0.0069	0.0019				
OC2	Hopper to Vibrating Pan Feeder	Underground wet ore	Moisture > 0.55%-2.88% range in AP-42 Table 11.19.2-2	0.0048	0.0016	4.4E-4					0.11	0.038	0.011					0.021	0.0069	0.0019				
OC3	Primary Crusher (including transfers in and out)	Underground wet ore	Moisture > 0.55%-2.88% range in AP-42 Table 11.19.2-2	0.041	0.018	0.0034					0.98	0.44	0.082					0.18	0.080	0.015				
OC4	Primary Crusher Discharge Conveyor Transfer to Screen Feed Conveyor	Underground wet ore	Moisture > 0.55%-2.88% range in AP-42 Table 11.19.2-2	0.0048	0.0016	4.4E-4					0.11	0.038	0.011					0.021	0.0069	0.0019				
OC5	Ore Screen (including transfers in and out)	Underground wet ore	Moisture > 0.55%-2.88% range in AP-42 Table 11.19.2-2	0.075	0.025	0.0017					1.8	0.60	0.041					0.33	0.11	0.0074				
OC6	Transfer to Secondary Crusher Surge Bin	Underground wet ore	Moisture > 0.55%-2.88% range in AP-42 Table 11.19.2-2	0.0048	0.0016	4.4E-4					0.11	0.038	0.011					0.021	0.0069	0.0019				
OC7	Secondary Crusher Surge Bin to Secondary Crusher Vibrating Feeder	Underground wet ore	Moisture > 0.55%-2.88% range in AP-42 Table 11.19.2-2	0.0048	0.0016	4.4E-4					0.11	0.038	0.011					0.021	0.0069	0.0019				
OC8	Secondary Crusher (including transfers in and out)	Underground wet ore	Moisture > 0.55%-2.88% range in AP-42 Table 11.19.2-2	0.041	0.018	0.0034					0.98	0.44	0.082					0.18	0.080	0.015				
OC9	Secondary Crusher Discharge Conveyor Transfer to Screen Feed Conveyor	Underground wet ore	Moisture > 0.55%-2.88% range in AP-42 Table 11.19.2-2	0.0048	0.0016	4.4E-4					0.11	0.038	0.011					0.021	0.0069	0.0019				
OC10	Screen Discharge Conveyor Transfer to Product Conveyor	Underground wet ore	Moisture > 0.55%-2.88% range in AP-42 Table 11.19.2-2	0.0048	0.0016	4.4E-4					0.11	0.038	0.011					0.021	0.0069	0.0019				
OC11	Product Conveyor Transfer to Fine Ore Bin	Underground wet ore	Moisture > 0.55%-2.88% range in AP-42 Table 11.19.2-2	0.0048	0.0016	4.4E-4					0.11	0.038	0.011					0.021	0.0069	0.0019				
OC12	Fine Ore Bin Discharge Feeder to Ball Mill Feed Conveyor	Underground wet ore	Moisture > 0.55%-2.88% range in AP-42 Table 11.19.2-2	0.0048	0.0016	4.4E-4					0.11	0.038	0.011					0.021	0.0069	0.0019				
OC13	Ball Mill Feed Conveyor to Ball Mill Transfer	Underground wet ore	Moisture > 0.55%-2.88% range in AP-42 Table 11.19.2-2	0.0048	0.0016	4.4E-4					0.11	0.038	0.011					0.021	0.0069	0.0019				
BC1	Dump of Borrow to Surge Bin			0.24	0.09	0.013					2.9	1.0	0.16					0.37	0.14	0.021				
BC2	Surge Bin to Vibrating Grizzly Transfer			0.24	0.09	0.013					2.9	1.0	0.16					0.37	0.14	0.021				
BC3	Primary Crusher (including transfers in and out)			0.43	0.19	0.029					5.1	2.3	0.34					0.67	0.30	0.044				
BC4	Crusher Discharge Conveyor Transfer Point			0.24	0.09	0.013					2.9	1.0	0.16					0.37	0.14	0.021				
BC5	Screen Feed Conveyor 1 Transfer Point			0.24	0.09	0.013					2.9	1.0	0.16					0.37	0.14	0.021				
BC6	Screen Feed Conveyor 2 Transfer Point			0.24	0.09	0.013					2.9	1.0	0.16					0.37	0.14	0.021				
BC7	Screen (including transfers in and out)			2.0	0.69	0.10					23.8	8.3	1.3					3.1	1.1	0.16				
BC8	Cone Crusher (including transfers in and out)			0.43	0.19	0.029					5.1	2.3	0.34					0.67	0.30	0.044				
BC9	Screen Discharge Conveyor Transfer to Stockpile Conveyor			0.24	0.09	0.013					2.9	1.0	0.16					0.37	0.14	0.021				
BC10	Ore Stockpile Conveyor Transfer to Borrow Stockpile			0.24	0.09	0.013					2.9	1.0	0.16					0.37	0.14	0.021				
WM1	Wet Milling	Wet process																						
LS1	Lime Silo Loading	Bin Vent	PM control efficiency included in emission factor	0.054	0.019	0.0028					0.054	0.019	0.0028					1.6E-4	5.6E-5	8.2E-6				
LS2	Lime Silo Unloading to Lime Slaker			1.8E-4	1.1E-4	1.5E-5					0.0043	0.0025	3.6E-4					7.9E-4	4.6E-4	6.6E-5				
CKD	Carbon Regeneration Kiln (Drum)	Wet Scrubber / Carbon Filter	PM control efficiency included in emission factor	0.060	0.060	0.060	1.1				1.4	1.4	1.4	25.2				0.26	0.26	0.26	4.6			
CKB	Carbon Regeneration Kiln (Burners)																							
EW	Electrowinning Cells & Pregnant Solution Tank	Carbon Filter	PM control efficiency included in emission factor																					

SOURCE DESCRIPTION		EMISSION CONTROLS		HOURLY EMISSIONS							DAILY EMISSIONS							ANNUAL EMISSIONS						
Model ID	Source Description	control system	efficiency reference	PM lb/hr	PM_{10} lb/hr	$PM_{2.5}$ lb/hr	CO lb/hr	NOx lb/hr	SO_2 lb/hr	VOC lb/hr	PM lb/day	PM_{10} lb/day	$PM_{2.5}$ lb/day	CO lb/day	NOx lb/day	SO_2 lb/day	VOC lb/day	PM ton/yr	PM_{10} ton/yr	$PM_{2.5}$ ton/yr	CO ton/yr	NOx ton/yr	SO_2 ton/yr	VOC ton/yr
MR	Mercury Retort	Condenser / Carbon Filter	PM control efficiency included in emission factor																					
MF	Melting Furnace	Baghouse / Carbon Filter	PM control efficiency included in emission factor	0.66	0.66	0.66	0.02	0.09	0.31	0.0015	9.8	9.8	9.8	0.164	0.657	2.332	0.011	0.26	0.26	0.26	0.009	0.034	0.121	0.0006
LABSP	Sample Preparation	Fume Hood		0.015	0.0058	5.5E-4					0.12	0.046	0.0044					0.022	0.0084	8.1E-4				
LABFA	Fire Assay	Fume Hood		0.063	0.063	0.063					0.50	0.50	0.50					0.091	0.091	0.091				
EDG1	Emergency Generator (Mfr. Yr. >2007; diesel)			0.88	0.88	0.88	15.4	28.2	0.0290	5.7	0.882	0.882	0.882	15.43	28.2	0.0290	5.73	0.0441	0.0441	0.0441	0.77	1.41	1.4E-3	0.287
EDFP	Emergency Diesel Fire Pump			0.09	0.09	0.09	1.5	1.8	0.0029	1.8	0.088	0.088	0.088	1.54	1.8	0.0029	1.76	0.0044	0.0044	0.0044	0.08	0.09	1.4E-4	0.088
HA	Administration HVAC			0.0077	0.0077	0.0077	0.082	0.142	0.0174	0.0087	0.184	0.184	0.184	1.97	3.41	0.42	0.210	0.0335	0.0335	0.0335	0.359	0.62	0.076	0.0383
HPO	Plant Office and Dry HVAC			0.0077	0.0077	0.0077	0.082	0.142	0.0174	0.0087	0.184	0.184	0.184	1.97	3.41	0.42	0.210	0.0335	0.0335	0.0335	0.359	0.62	0.076	0.0383
HL	Laboratory HVAC			0.0077	0.0077	0.0077	0.082	0.142	0.0174	0.0087	0.184	0.184	0.184	1.97	3.41	0.42	0.210	0.0335	0.0335	0.0335	0.359	0.62	0.076	0.0383
HWW	Plant Workshop and Warehouse HVAC			0.0077	0.0077	0.0077	0.082	0.142	0.0174	0.0087	0.184	0.184	0.184	1.97	3.41	0.42	0.210	0.0335	0.0335	0.0335	0.359	0.62	0.076	0.0383
HTW	Truck Workshop and Warehouse HVAC			0.0153	0.0153	0.0153	0.164	0.28	0.035	0.0175	0.37	0.37	0.37	3.9	6.8	0.83	0.42	0.067	0.067	0.067	0.72	1.24	0.152	0.077
HMO	Mine Office and Changehouse HVAC			0.0077	0.0077	0.0077	0.082	0.142	0.0174	0.0087	0.184	0.184	0.184	1.97	3.41	0.42	0.210	0.0335	0.0335	0.0335	0.359	0.62	0.076	0.0383
CEM1	Cement/Shotcrete loading to silo	Bin Vent	PM control efficiency included in emission factor	0.079	0.027	0.0040					0.079	0.027	0.0040					0.0093	0.0032	4.7E-4				
CEM2	Cement/Shotcrete unloading to batch plant	Bin Vent	PM control efficiency included in emission factor	0.079	0.027	0.0040					0.079	0.027	0.0040					0.0093	0.0032	4.7E-4				
CEM3	Aggregate transfer			0.97	0.47	0.071					7.8	3.7	0.56					0.86	0.41	0.062				
CEM4	Weigh hopper loading			0.68	0.39	0.056					5.4	3.2	0.45					0.60	0.35	0.050				
CEM5	Mixer loading (central mix)	Types of controls used may include water sprays, enclosures, hoods, curtains, shrouds, movable and telescoping chutes, central duct collection systems, and the like	PM control efficiency included in emission factor	0.20	0.058	0.0085					1.6	0.47	0.068					0.172	0.052	0.0075				
TG1	Mine Site Gasoline Tank #1									0.211							5.1							0.93
TD1	Mine Site Diesel Tank #1									9.3E-4							0.022							0.0041
TD2	Mine Site Diesel Tank #2									9.8E-5							0.0024							4.3E-4
Total				**8.6**	**4.6**	**2.2**	**18.6**	**31.1**	**0.5**	**7.8**	**87.9**	**43.5**	**18.5**	**56.1**	**54.5**	**5.3**	**14.08**	**10.5**	**4.7**	**1.5**	**8.0**	**5.9**	**0.7**	**1.6**

Mining Activity Emissions Emissions Summary

By Area/Model ID

		PM_PPD	PM_TPY	PM10_PPD	PM10_TPY	PM2.5_PPD	PM2.5_TPY	CO_PPH	CO_TPY	NOX_PPH	NOX_TPY	SO2_PPH	SO2_TPY	VOC_TPY
Area/	Location of	PM	PM	PM10		PM2.5		CO		NOX		SO2		VOC
Model ID	Activity	lb/day	ton/yr	lb/day	ton/yr	lb/day	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	ton/yr
UG	Underground	224.15	23.31	60.63	6.31	6.08	0.63	3.45	8.60	0.65	1.63	3.8E-4	9.5E-4	--
BRW	Borrow Pit	7.62	0.99	3.93	0.51	0.28	3.6E-2	--	--	--	--	--	--	--
BRWBLAST	Borrow Blasting	4.95	6.4E-2	2.57	3.3E-2	0.15	1.9E-3	175.88	2.29	4.73	6.1E-2	9.5E-3	1.2E-4	--
WRSF	WRSF	1.16	0.15	0.57	7.4E-2	8.6E-2	1.1E-2	--	--	--	--	--	--	--
CRF	CRF Stockpile	1.22	0.15	0.60	7.4E-2	9.0E-2	1.1E-2	--	--	--	--	--	--	--
STK	Ore Stockpile	1.11	0.14	0.56	7.2E-2	8.3E-2	1.1E-2	--	--	--	--	--	--	--
TS1	Topsoil Storage 1	0.13	1.7E-2	6.7E-2	8.6E-3	1.0E-2	1.3E-3	--	--	--	--	--	--	--
TS2	Topsoil Storage 2	5.5E-2	7.1E-3	2.7E-2	3.6E-3	4.1E-3	5.4E-4	--	--	--	--	--	--	--
HR	Haul Roads	117.40	13.64	31.94	3.70	3.22	0.37	--	--	--	--	--	--	--
Total		357.79	38.48	100.90	10.78	10.00	1.08	179.32	10.89	5.38	1.69	9.8E-3	1.1E-3	--
		chk	chk	chk	chk	chk	chk	chk	chk	chk	chk	chk	chk	chk

By Activity

	PM	PM	PM10		PM2.5		CO		NOX		SO2		VOC
Activity	lb/day	ton/yr	lb/day	ton/yr	lb/day	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	ton/yr
Underground Drilling	0.24	2.5E-2	0.11	1.2E-2	0.017	1.8E-3	--	--	--	--	--	--	--
Borrow Drilling	6.50	0.85	3.38	0.44	0.195	2.5E-2	--	--	--	--	--	--	--
Underground Blasting	0.91	9.5E-2	0.47	4.9E-2	0.027	2.8E-3	3.45	8.60	0.65	1.63	3.8E-4	9.5E-4	--
Borrow Blasting	4.95	6.4E-2	2.57	3.3E-2	0.15	1.9E-3	175.88	2.29	4.73	6.1E-2	9.5E-3	1.2E-4	--
Onsite Hauling	270.22	29.05	71.52	7.69	7.15	0.77	--	--	--	--	--	--	--
Material Load / Unload	0.77	9.2E-2	0.36	4.3E-2	5.5E-2	6.6E-3	--	--	--	--	--	--	--
Material Load / Unload UG	0.29	3.1E-2	0.14	1.4E-2	2.1E-2	2.2E-3	--	--	--	--	--	--	--
Grading	51.39	5.34	15.42	1.60	1.59	0.17	--	--	--	--	--	--	--
Water Truck Travel	18.50	2.41	4.90	0.64	0.49	6.4E-2	--	--	--	--	--	--	--
Wind Erosion	4.02	0.52	2.01	0.26	0.302	3.9E-2	--	--	--	--	--	--	--
Total	357.79	38.48	100.90	10.78	10.00	1.08	179.32	10.89	5.38	1.69	9.8E-03	1.1E-03	--
	chk	chk	chk	chk	chk	chk	chk	chk	chk	chk	chk	chk	chk

Mining Activity Emissions Source Parameters Summary

		TYPE	UTM_E	UTM_N	ELEV_M	RELHT_M	SIG_Y_M	SIG_Z_M	SXINIT_M	SYINIT_M	ANGL_DEG
	Location of	Source	UTM NAD 83		Elev.	Rel. Ht.	S-y	S-z	X-init.	Y-init.	Angle
Model ID	Activity	Type	E m	N m	m	m	m	m	m	m	deg
UG	Underground	POINT	471,034	4,835,236	1,209.0	3.0	*point*	*point*	*point*	*point*	*point*
BRW	Borrow Pit	AREA	471,620	4,834,732	1,185.3	2.3	*area*	2.1	208.3	833.3	-
BRWBLAST	Borrow Blasting	VOLUMI	471,724	4,835,149	1,185.3	75.0	20.9	34.9	*volume*	*volume*	*volume*
WRSF	WRSF	VOLUME	470,616	4,835,523	1,113.7	2.3	27.5	2.1	*volume*	*volume*	*volume*
CRF	CRF Stockpile	VOLUME	470,903	4,835,531	1,140.3	2.3	4.9	2.1	*volume*	*volume*	*volume*
STK	Ore Stockpile	VOLUME	470,988	4,835,618	1,137.0	2.3	7.8	2.1	*volume*	*volume*	*volume*
TS1	Topsoil Storage 1	AREA	470,380	4,836,336	1,108.4	-	*area*	-	150.2	300.5	58.4
TS2	Topsoil Storage 2	AREA	470,138	4,835,247	1,083.6	-	*area*	-	144.1	144.1	-
HR	Haul Roads	LINE	See worksheet: ROADS			2.3	9.9	2.1	*volume*	*volume*	*volume*
TSF	*Tailings Storage Facility*	AREA	470,109	4,835,831	1,103.4	-	*area*	-	418.5	836.9	59.5
POND	Tailings Pipeline Reclaim Pond	AREA	470,720	4,836,288	1,076.1	-	*area*	-	38.6	38.6	-
LEACH1	CN Leach Tank 1	AREA	471,022.1	4,835,705.2	1,133.8	7.8	*area*	-	5.8	5.8	-
LEACH2	CN Leach Tank 2	AREA	471,030.1	4,835,705.2	1,133.8	7.8	*area*	-	5.8	5.8	-
CILTANK1	CIL Tank 1	AREA	471,037.1	4,835,705.2	1,133.8	7.8	*area*	-	5.8	5.8	-
CILTANK2	CIL Tank 2	AREA	471,045.1	4,835,705.2	1,133.8	7.8	*area*	-	5.8	5.8	-
CILTANK3	CIL Tank 3	AREA	471,049.1	4,835,698.2	1,133.8	7.8	*area*	-	5.8	5.8	-
CILTANK4	CIL Tank 4	AREA	471,041.1	4,835,698.2	1,133.8	7.8	*area*	-	5.8	5.8	-
CILTANK5	CIL Tank 5	AREA	471,033.1	4,835,698.2	1,133.8	7.8	*area*	-	5.8	5.8	-
CILTANK6	CIL Tank 6	AREA	471,026.1	4,835,698.2	1,133.8	7.8	*area*	-	5.8	5.8	-
CILTANK7	CIL Tank 7	AREA	471,018.1	4,835,698.2	1,133.8	7.8	*area*	-	5.8	5.8	-

Ponds and tank model parameters included for use in modeling TACs.

			PM10-24_gps	PM10-AN_gps	PM2.5-24_gps	PM2.5-AN_gps	CO-ALL_gps	NO2-1_gps	NO2-AN_gps	SO2-1_gps	SO2-AN_gps	NO2_ISR
	Source		PM10	PM10	PM2.5	PM2.5	CO	NOX	NOX	SO2	SO2	NO2/NOX
Model ID	Type	Units	24-hr	Annual	24-hr	Annual	1- & 8-hr	1-hr	Annual	1-, 3- & 24-h	Annual	ISR
UG	POINT	g/s	3.2E-1	1.8E-1	3.2E-2	1.8E-2	4.3E-1	8.2E-2	4.7E-2	4.8E-5	2.7E-5	9.93%
BRW	AREA	g/s/m^2	1.2E-7	8.5E-8	8.4E-9	6.0E-9	-	-	-	-	-	-
BRWBLAST	VOLUME	g/s	1.4E-2	9.6E-4	7.8E-4	5.6E-5	2.2E+1	1.8E-3	1.8E-3	1.2E-3	3.5E-6	3.57%
WRSF	VOLUME	g/s	3.0E-3	2.1E-3	4.5E-4	3.2E-4	-	-	-	-	-	-
CRF	VOLUME	g/s	3.1E-3	2.1E-3	4.7E-4	3.2E-4	-	-	-	-	-	-
STK	VOLUME	g/s	2.9E-3	2.1E-3	4.4E-4	3.1E-4	-	-	-	-	-	-
TS1	AREA	g/s/m^2	7.7E-9	5.5E-9	1.2E-9	8.3E-10	-	-	-	-	-	-
TS2	AREA	g/s/m^2	6.9E-9	4.9E-9	1.0E-9	7.4E-10	-	-	-	-	-	-
HR	LINE	g/s	1.7E-1	1.1E-1	1.7E-2	1.1E-2	-	-	-	-	-	-
			chk	chk	chk	chk	chk	chk	chk	chk	chk	

Model borrow blasting NOx as an intermitant source: Yes

Borrow blasting is an intermitant operation, therefore the short-term modeled NOx emission rate is set equal to the annual emissions

UG ISR based on emission weighted average of ISRs for Undergroupd Blasting and Tailpipe sources.

Conversion Factors

453.59	g/lb	24 hr/day	8,760 hr/yr
2,000	lb/ton	3,600 s/hr	

Pit and Tunnel Drilling

Activity Information

Underground schedule	208	day/yr	12	hrs/shift	2 shifts/day	*(Ausenco 2020) p. 166*
Underground Blast sched.	58	holes/blast	2.0	hrs/cycle	*(Ausenco 2020) p. 167, 198*	
Borrow schedule	260	day/yr	12	hrs/day	*(Dyer 2019.04.26)*	
Borrow Pit Blast sched.	50	holes/blast	1,300	holes/yr	*(Dyer 2019.04.26)*	

Annual LOM- rates			Material blasted			Drilling	
Underground	1,400	ton/day	291,200	ton/yr	*(Ausenco 2020) p.26*	143,741	hole/yr
Borrow	950	ton/day	247,000	ton/yr	*(Dyer 2019.04.26)*	1,300	hole/yr
Total			538,200	ton/yr		145,041	hole/yr

Emission Factors	Underground			Borrow	
TSP (PM)				1.3 lb/hole	*(EPA 1995), Tab. 11.9-4, 7/98 (overburden)*
PM10	0.00008	lb/ton	*(EPA 1995), Table 11.19.2-2, 8/04*		
PM Scaling Factors					
PM	0.74		*(EPA 1995), Sec. 13.2.4-4, 11/06*	1	
PM10	0.35		*(EPA 1995), Sec. 13.2.4-4, 11/06*	0.52	*(EPA 1995), Tab. 11.9-1, 7/98 (blasting, overburden)*
PM2.5	0.053		*(EPA 1995), Sec. 13.2.4-4, 11/06*	0.03	*(EPA 1995), Tab. 11.9-1, 7/98 (blasting, overburden)*

Underground drilling will be a wet process: (Ausenco 2020)

Emissions by Model ID

		PM_PPD	PM_TPY	PM10_PPD	PM10_TPY	PM2.5_PPD	PM2.5_TPY
		PM	PM	PM10		PM2.5	
Model ID	Activity	lb/day	ton/yr	lb/day	ton/yr	lb/day	ton/yr
UG	Underground Drilling	0.237	0.025	0.11	0.012	0.017	0.0018
BRW	Borrow Drilling	6.50	0.85	3.4	0.44	0.20	0.025
Total	Pit and Tunnel Drilling	6.74	0.8696	3.5	0.45	0.21	0.027

Source Parameters [1]

		TYPE	UTM_E	UTM_N	ELEV_M	FLOW_MPS	DIA_M	TEMP_K	RELHT_M
		Source	UTM NAD 83		Elev.	Vel.	Dia.	Temp	Ht
Model ID	Activity	Type	E m	N m	m	mps	m	K	m
UG	Underground	POINT	471,034	4,835,236	1,209	20.98	3.66	298.15	3

[1] *UTM, Elev. - (Wolverson 2019.03.17); Stack Params: (Auscenco 2020) pages 254-255*

Source Parameters [1]

		TYPE	UTM_E	UTM_N	ELEV_M	RELHT_M	SIG_Z_M	SXINIT_M	SYINIT_M	ANGL_DEG		Area
		Source	UTM NAD 83		Elev.	Rel. Ht.	S-z	Pit X	Pit Y	Angle	WCB	
Model ID	Activity	Type	E m	N m	m	m	m^3	m	m	deg	deg	
BRW	Borrow	AREA	471,620	4,834,732	1,185	2.25	2.10	208.3	833.3	0.0	90	173576.39

[1] *UTM - (Auscenco 2021); Elev., Pit Vol. - (Wolverson 2019.03.17); Rel. Ht. - (EPA 2012); Pit X, Pit Y, Angle - best-fit equal area rectangle*

Conversions

2,000	lb/ton
3.28084	ft/m
60	sec/min

Plume Parameter	Calculatio	Value (m)	Const.
Plume top (PT) - unpaved	1.7 x VH	4.50	1.7
Release height - unpaved	0.5 x PT	2.25	0.5
Plume width (PW)	RW + 6 m	21.24	6
Sigma-z - unpaved	PT / 2.15	2.10	2.15
Sigma-y	PW / 2.15	9.88	2.15

(EPA 2012)

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: M. Mavko
	PROJECT NO: 343-1	PAGE: 4 OF: 21 SHEET: Mine
AIR EMISSION CALCULATIONS	SUBJECT: Mining Activity Emissions	DATE: July 18, 2022

Open Pit and Underground Blasting

Activity Information

Underground schedule	208 day/yr	12 hrs/shift	2 shifts/day	*(Ausenco 2020) p. 166*
Underground Blasting	278.6 ft^2/blast	14 blast/day		*(Ausenco 2020) p. 167, 202; Conservative estimate*
Borrow Schedule	260 day/yr	12 hr/day		*(Dyer 2019.04.26)*
Borrow Blasting	100 ft^2/hole	50 holes/blast		*(Dyer 2019.04.26)*

Annual LOM- rates	Material blasted	Blasting	ANFO/emulsion use	
Underground	291,200 ton/yr	2,912 blast/yr	529 ton emulsion/yr	*(MDA 2018) p. 159*
Borrow	247,000 ton/yr	26 blast/yr	68 ton ANFO/yr	*(Dyer 2019.04.26)*
Total	538,200 ton/yr	2,938 blast/yr		

Emission Factors

	Underground			Borrow		
A = Area per blast	279 ft^2			5,000 ft^2		TSP (lb/blast) = 0.000014 x $A^{1.5}$
TSP (PM)	0.07 lb/blast			4.95 lb/blast		*(EPA 1995), Tab. 11.9-1, 7/98 (blasting, overburden)*
CO	32.53 lb/ton-emulsion		*(NIOSH n.d.)*	67 lb/ton-ANFO		*(EPA 1995), Tab. 13.3-1, 2/80 (ANFO)*
NOX	6.16 lb/ton-emulsion		*(NIOSH n.d.)*	0.9 kg/t-ANFO		*(CSIRO 2008)*
				1.8 lb/ton-ANFO		
SO2	3.6E-03 lb/ton-emulsion			3.6E-03 lb/ton-ANFO		
				Based on: 6% *diesel content in ANFO (NIOSH n.d.)*		

$$\frac{1.5\text{E-}05 \text{ ~~lb S~~}}{\text{~~lb FO~~}} \times \frac{2 \text{ lb SO2}}{\text{~~lb S~~}} \times \frac{6\% \text{ ~~lb FO~~}}{\text{~~lb ANFO~~}} \times \frac{2{,}000 \text{ ~~lb ANFO~~}}{\text{ton ANFO}} = \frac{3.6\text{E-}03 \text{ lb SO2}}{\text{ton ANFO}}$$

PM Scaling Factors

PM10	0.52	*(EPA 1995), Tab. 11.9-1, 7/98 (blasting, overburden)*
PM2.5	0.03	*(EPA 1995), Tab. 11.9-1, 7/98 (blasting, overburden)*

Emissions by Model ID

		PM_PPD	PM_TPY	PM10_PPD	PM10_TPY	PM2.5_PPD	PM2.5_TPY	CO_PPH	CO_TPY	NOX_PPH	NOX_TPY	SO2_PPH	SO2_TPY
		PM		PM10		PM2.5		CO		NOX[1]		SO2	
Model ID	Activity	lb/day	ton/yr	lb/day	ton/yr	lb/day	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
UG	Underground Blasting	0.911	0.095	0.47	0.049	0.027	0.0028	3.4	8.6	0.7	1.6	3.8E-4	9.5E-4
BRWBLAST	Borrow Blasting	4.950	0.064	2.574	0.033	0.148	0.0019	176	2.3	4.7	0.061	9.5E-3	1.2E-4
Total	Blasting	5.86	0.1591	3.0	0.083	0.18	0.0048	179	10.9	5.4	1.7	9.8E-3	1.1E-3

[1] *NO2/NOX:* 0.0357

Source Parameters [1]

		TYPE	UTM_E	UTM_N	ELEV_M	RELHT_M	SIG_Y_M	SIG_Z_M
		Source	UTM NAD 83		Elev.	Rel. Ht.	S-y	S-z
Model ID	Activity	Type	E m	N m	m	m	m	m
BRWBLAST	Borrow Blasting	VOLUME	471,724	4,835,149	1,185	75	20.93	34.88

[1] *UTM, Elev. - (Wolverson 2019.03.17); Rel. Ht. - (CSIRO 2008); S-y, S-z factors - (EPA 2016)*

Source Parameters [1]

		TYPE	UTM_E	UTM_N	ELEV_M	FLOW_MPS	DIA_M	TEMP_K	RELHT_M
		Source	UTM NAD 83		Elev.	Flow	Dia.	Temp	Ht
Model ID	Activity	Type	E m	N m	m	mps	m	K	m
UG	Underground Blasting	POINT	471,034	4,835,236	1,209	20.98	3.66	298.15	3

[1] *UTM, Elev. - (Wolverson 2019.03.17); Stack Params: (Auscenco 2020) pages 254-255*

Conversions		Blast height (BH)	150 m	*(CSIRO 2008)*	Sigma divider			
2,000	lb/ton	Blast width	90 m	*(CSIRO 2008)*	Rel. Ht.	2	of BH	*(EPA 2016b)*
2.205	lb/kg	Blast depth	90 m	*(CSIRO 2008)*	S-y	4.3	of SL	*(EPA 2016b)*
1.102	ton/t	Equal area side length (SL)	90 m		S-z	4.3	of BH	*(EPA 2016b)*

Onsite Hauling

Activity Information

Operating schedule	208 day/yr	*(Ausenco 2020) p. 166*
Percent backfill as CRF	100%	*(Ausenco 2020) p. 27*
Borrow Schedule	260 day/yr	

Hauling Routes, Production Rates and Distances

Route Origin		Destination		Material Type	Material Hauled [1] Rate ton/yr	One-Way Hauling [2] mi	Truck Loads [3] load/yr	Total Travel [4] VMT/yr
Unpaved Roads								
PC- Portal Cut	PC	WRSF	WRSF	Rock	1,500	0.23	62	29
PC- Portal Cut	PC	Ore Stockpile	STK	Ore	289,700	0.15	11,947	3,697
UG- Underground	UG	Portal Cut	PC	Ore	289,700	1.62	11,947	38,728
UG- Underground	UG	Portal Cut	PC	Rock	1,500	1.62	62	201
BRW Borrow	BRW	WRSF	WRSF	Rock	247,000	1.02	5,465	11,141
WR WRSF	WRSF	Portal Cut	PC	Rock	--	0.23	--	--
WR WRSF	WRSF	CRF Stockpile	CRF	Rock	248,500	0.21	10,248	4,289
CRF CRF Stockpile	CRF	Portal Cut	PC	Rock	248,500	0.06	10,248	1,262
UGP UG Portal	UGP	Underground	UG	Rock	248,500	1.62	10,248	33,221
Total					1,574,900	6.77		92,568
				Aboveground Subtotal		1.91		
				Underground Subtotal		4.86		

[1] *(Ausenco 2020)*

[2] *(Wolverson 2019.03.17); Underground: (Ausenco 2020) p. 205*

[3] *See truck fleet information below.*

[4] *Truck loads* × *One-way hauling* 2 *(round-trip)*

Truck Fleet

Truck		Payload Capacity [1] ton	Empty Weight [1] ton	Operation [2] hr/yr	Average Weight ton
Cat AD22	Mine	24.25	24.5	11,981	36.6
Cat 745C	Borrow	45.2	36.8	3,994	59.4
Weighted Average		29.5			42.3

[1] *Cat AD22: (Caterpillar 2018)*

[2] *Cat AD22: (MDA 2018) p. 167; Cat 745: Borrow Schedule units.*

Conversions

2,000 lb/ton

5,280 ft/mi

Onsite Hauling - continued

Hauling Emissions by Route

	Route Origin		Destination		Material Hauled Material Type	PM_TPY PM ton/yr	PM10_PPD PM10 lb/day	PM10_TPY PM10 ton/yr	PM2.5_PPD PM2.5 lb/day	PM2.5_TPY PM2.5 ton/yr
	Unpaved Roads									
PC-WRSF	Portal Cut	PC	WRSF	WRSF	Rock	1.2E-2	3E-2	3.2E-3	3.1E-3	3.2E-4
PC-STK	Portal Cut	PC	Ore Stockpile	STK	Ore	1.6	4.0	0.42	0.40	4.2E-2
UG-PC	Underground	UG	Portal Cut	PC	Ore	10.9	27.8	2.9	2.78	0.29
UG-PC	Underground	UG	Portal Cut	PC	Rock	0.057	0.14	1.50E-02	1.4E-2	1.5E-3
BRW-WRSF	Borrow	BRW	WRSF	WRSF	Rock	4.7	9.6	1.3	0.96	0.13
WRSF-PC	WRSF	WRSF	Portal Cut	PC	Rock	--	--	--	--	--
WRSF-CRF	WRSF	WRSF	CRF Stockpile	CRF	Rock	1.82	4.64	0.48	0.46	4.8E-2
CRF-PC	CRF Stockpile	CRF	Portal Cut	PC	Rock	0.54	1.37	0.14	0.14	0.0142
UGP-UG	UG Portal	UGP	Underground	UG	Rock	9.38	23.87	2.48	2.39	0.25
	Pit Subtotal					29.05	71.52	7.69	7.15	0.77

Aboveground Emission Factors

Emission factor equation: $E = k(s/12)^a (W/3)^b [(365-P)/365]$ *(EPA 1995), Tab. 13.2.2-2, Eqs. 1a and 2, 11/06*

s = Surface material silt content: 5.8 % *(EPA 1995), Tab. 13.2.2-1 Taconite Mining*

W = Mean vehicle weight: 59.4 ton

P = Days/year with ≥0.01 in precip.: 90 day/yr *(EPA 1995), Fig. 13.2.2-1, 11/06*

	PM	PM10	PM2.5		
k = Size-specific empirical constant	4.9	1.5	0.15		*(EPA 1995), Tab. 13.2.2-2, Eqs. 1a and 2, 11/06*
a = Size-specific empirical constant	0.7	0.9	0.9		*(EPA 1995), Tab. 13.2.2-2, Eqs. 1a and 2, 11/06*
b = Size-specific empirical constant	0.45	0.45	0.45		*(EPA 1995), Tab. 13.2.2-2, Eqs. 1a and 2, 11/06*
E = Size-specific emission factor	8.51	2.25	0.225	lb/VMT	

Aboveground Emission Controls

Aboveground unpaved roads - periodic application of water and chemical dust suppressant

Control efficiency: 90% *(Air Sciences 2018)*

Underground Emission Factors

Emission factor equation: $E = k(s/12)^a (W/3)^b$ *(EPA 1995), Tab. 13.2.2-2, Eq. 1a, 11/06*

	PM	PM10	PM2.5	
k = Size-specific empirical constant	4.9	1.5	0.15	
a = Size-specific empirical constant	0.7	0.9	0.9	
b = Size-specific empirical constant	0.45	0.45	0.45	
E = Size-specific emission factor	11.29	2.99	0.299	lb/VMT

Underground Emission Controls

Control efficiency: 95% *AP-42, Fig. 13.2.2-2, 11/06*

Since dewatering is needed assume maximum control (wet conditions) (MDA 2018) p. 155

Conversions

2,000 lb/ton

Onsite Hauling - continued

Underground Emissions Comparison

Umax = PM2.5 conc. from Rock Dust in an underground gold mine	72.2	ug/m3	*(McDonald et al. 2003), Tab. 4*
V= Through-flow ventilation	142	m3/sec	*(McDonald et al. 2003), p. 387*
Production rate	1,300	tons/day	*(McDonald et al. 2003), p. 387*
Underground Rock Dust Emissions Rate (URDER)	V * (U_{max}) * (sec/day) / (tons/day) / (g/lb) / (ug/g)		

Summary of Underground Fugitive Emissions

Activity	PM2.5 lb/day
Underground Hauling (95% CE)	5.2
WRSF load/unload (page 8)	0.017
Underground Blasting	0.027
Underground Drilling	0.017
Total	5.2
Grassy Mtn. Production rate	1,400 tons/day

URDER	0.0015	lb/ton
Grassy Mtn	0.0037	lb/ton

Emissions by Area

		chk	PM_PPD	PM_TPY	PM10_PPD	PM10_TPY	PM2.5_PPD	PM2.5_TPY
		Travel	PM		PM10		PM2.5	
Area ID	Activity	VMT/yr	lb/day	ton/yr	lb/day	ton/yr	lb/day	ton/yr
HR-BRW	Borrow Pit Hauling	11,141	36.45	4.74	9.65	1.25	0.96	0.13
UG	Underground Hauling	72,150	195.82	20.37	51.83	5.39	5.18	0.54
HR-PC	Process Area Hauling	9,277	37.94	3.95	10.04	1.04	1.00	0.10
Total		92,568	270	29.0503	71.5	7.7	7.2	0.8
See worksheet ROADS for haul road (HR) emissions by Model				chk	chk	chk	chk	chk

Source Parameters [1]

		TYPE	UTM_E	UTM_N	ELEV_M	RELHT_M	SIG_Y_M	SIG_Z_M
		Source	UTM NAD 83		Elev.	Rel. Ht.	S-y	S-z
Model ID	Activity	Type	E m	N m	m	m	m	m
HR	Aboveground Hauling	LINE	*See worksheet: ROADS*			2.25	9.88	2.10

UTM, Elev. - (EPA 2012)

Source Parameters [1]

		TYPE	UTM_E	UTM_N	ELEV_M	FLOW_MPS	DIA_M	TEMP_K	RELHT_M
		Source	UTM NAD 83		Elev.	Flow	Dia.	Temp	Ht
Model ID	Activity	Type	E m	N m	m	mps	m	K	m
UG	Underground	POINT	471,034	4,835,236	1,209	20.98	3.66	298.15	3

UTM, Elev. - (Wolverson 2019.03.17); Stack Params: (Auscenco 2020) pages 254-255

Truck	Height		Reference
Cat AD22	2.5	m	*(Caterpillar 2021b)*
Cat 745C	3	m	*(Caterpillar 2018)*
Weighted	2.65	m	
Road width (RW)	15.2	m	*(Wolverson 2019.03.17)*

Plume Parameter	Calculation	Value (m)	Const.
Plume top (PT) - unpaved	1.7 x VH	4.50	1.7
Release height - unpaved	0.5 x PT	2.25	0.5
Plume width (PW)	RW + 6 m	21.24	6
Sigma-z - unpaved	PT / 2.15	2.10	2.15
Sigma-y	PW / 2.15	9.88	2.15
(EPA 2012)			

Conversions

2,000	lb/ton	453.59	g/lb
3.28	ft/m	86,400	sec/day
12	in/ft	1.E+06	ug/g

Material Load / Unload

Activity Information

Operating schedule	208	day/yr	*(Ausenco 2020) p. 166*
Percent backfill as CRF	100%		*(Ausenco 2020) p. 27*
Borrow Schedule	260	day/yr	

Hauling Routes, Production Rates and Distances

	Route Origin		Destination		Material Hauled [1] Material Type	Rate ton/yr
	Unpaved Roads					
PC-WRSF	Portal Cut	PC	WRSF	WRSF	Rock	1,500
PC-STK	Portal Cut	PC	Ore Stockpile	STK	Ore	289,700
UG-PC	Underground	UG	Portal Cut	PC	Ore	289,700
UG-PC	Underground	UG	Portal Cut	PC	Rock	1,500
BRW-WRSF	Borrow	BRW	WRSF	WRSF	Rock	247,000
WRSF-PC	WRSF	WRSF	Portal Cut	PC	Rock	--
WRSF-CRF	WRSF	WRSF	CRF Stockpile	CRF	Rock	248,500
CRF-PC	CRF Stockpile	CRF	Portal Cut	PC	Rock	248,500
UGP-UG	UG Portal	UGP	Underground	UG	Rock	248,500
	Total					1,574,900

[1] *(Ausenco 2020)*

Throughput Rates

Model ID	Location of Activity	Type of Material	Type of Transfer	Rate ton/yr	Xfer Description
UG	Underground	Ore	Load	289,700	Load Ore
UG	Underground	Rock	Unload	1,500	Rock & Unload Backfill
BRW	Borrow	Rock	Load	247,000	Load
WRSF	WRSF	Rock	Unload	248,500	Unload from Borrow
WRSF	WRSF	Rock	Load	248,500	Load to CRF
STK	Ore Stockpile	Ore	Unload	289,700	Unload
CRF	CRF Stockpile	Rock	Unload	248,500	Unload from WRSF
CRF	CRF Stockpile	Rock	Load	248,500	Load to Portal

Conversions

2,000 lb/ton

5,280 ft/mi

Material Load / Unload - continued

Activity Information

Mine Operating schedule - Underground 208 day/yr
Borrow schedule 260 day/yr

Emission Factors

	PM	PM10	PM2.5		
k = Particle size multiplier	0.74	0.35	0.053		*(EPA 1995), Sec. 13.2.4, Pg. 4, 11/06*
E = Emission factor Load	0.00021	0.0001	0.00002	lb/ton	*(EPA 1995), Tab. 11.19.2-2, 8/04 (truck loading - crshed stone)*
Unload	0.00003	0.000016	0.000002	lb/ton	*(EPA 1995), Tab. 11.19.2-2, 8/04 (truck unloading - fragmented stone)*

Emissions by Model ID

			chk	PM_PPD	PM_TPY	PM10_PPD	PM10_TPY	PM2.5_PPD	PM2.5_TPY
	Location of	Activity	Total Rate	PM	PM	PM10		PM2.5	
Model ID	Activity		ton/yr	lb/day	ton/yr	lb/day	ton/yr	lb/day	ton/yr
UG	Underground	Load	289,700	0.29	3.1E-2	0.14	1.4E-2	2.1E-2	2.2E-3
UG	Underground	Unload	1,500	2.4E-4	2.5E-5	1.2E-4	1.2E-5	1.7E-5	1.8E-6
BRW	Borrow	Load	247,000	0.20	2.6E-2	0.10	1.2E-2	1.4E-2	1.9E-3
WRSF	WRSF	Unload	248,500	3.2E-2	4.2E-3	1.5E-2	2.0E-3	2.3E-3	3.0E-4
WRSF	WRSF	Load	248,500	0.20	2.6E-2	0.10	1.2E-2	1.4E-2	1.9E-3
STK	Ore Stockpile	Unload	289,700	3.8E-2	4.9E-3	1.8E-2	2.3E-3	2.7E-3	3.5E-4
CRF	CRF Stockpile	Unload	248,500	4.0E-2	4.2E-3	1.9E-2	2.0E-3	2.9E-3	3.0E-4
CRF	CRF Stockpile	Load	248,500	0.25	2.6E-2	0.12	1.2E-2	1.8E-2	1.9E-3
Total	Material Load / Unload		1,821,900	1.06	0.12	0.50	5.8E-2	7.6E-2	8.8E-3

Conversions
2.237 mi/hr per m/s
2,000 lb/ton

Material Load / Unload - continued

Source Parameters [1]	TYPE	UTM_E	UTM_N	ELEV_M	RELHT_M	SIG_Z_M	SXINIT_M	SYINIT_M	ANGL_DEG	
	Location of	Source	UTM NAD 83		Elev.	Rel. Ht.	S-z	Pit X	Pit Y	Angle	WCB
Model ID	Activity	Type	E m	N m	m	m	m^3	m	m	deg	deg
BRW	Borrow	AREA	471,620	4,834,732	1,185	2.25	2.10	208.3	833.3	0.0	90

[1] *UTM - (Auscenco 2021); Elev., Pit Vol. - (Wolverson 2019.03.17); Rel. Ht. - (EPA 2012); Pit X, Pit Y, Angle - best-fit equal area rectangle*

Source Parameters [1]	TYPE	UTM_E	UTM_N	ELEV_M	RELHT_M	SIG_Y_M	SIG_Z_M	Surface	
	Location of	Source	UTM NAD 83	Elev.	Rel. Ht.	S-y	S-z	Area	Length
Model ID	Activity	Type	E m	N m	m	m	m	m^2	m
WRSF	WRSF	VOLUME	470,616	4,835,523	1,114	2.25	27.47	2.10	13,956	118.1
STK	Ore Stockpile	VOLUME	470,988	4,835,618	1,137	2.25	7.76	2.10	1,113	33.4
CRF	CRF Stockpile	VOLUME	470,903	4,835,531	1,140	2.25	4.91	2.10	445	21.1

[1] *UTM - (Auscenco 2021); Elev., Area - (Wolverson 2019.03.17); Rel. Ht. - (Caterpillar 2018); S-y - (Auscenco 2021); S-z - (Wolverson 2019.03.17)*

Source Parameters [1]	TYPE	UTM_E	UTM_N	ELEV_M	FLOW_MPS	DIA_M	TEMP_K	RELHT_M
		Source	UTM NAD 83	Elev.	Flow	Dia.	Temp	Ht
Model ID	Activity	Type	E m	N m	m	mps	m	K	m
UG	Underground	POINT	471,034	4,835,236	1,209	20.98	3.66	298.15	3

[1] *UTM, Elev. - (Wolverson 2019.03.17); Stack Params: (Auscenco 2020) pages 254-255*

Vehicle height (VH):
Weighted Average 2.65 m

Plume Parameter	Calculation	Value (m)	Const.
Plume top (PT)	1.7 x VH	4.50	1.7
Release height	0.5 x PT	2.25	0.5
Sigma-z	PT / 2.15	2.10	2.15

(EPA 2012)

Sample calculation for WRSF

Plume Parameter	Calculation	Value (m)	Const.
Surface area (SA)	Map	13,956	
Side length (SL)	SA^0.5	118.1	0.5
Sigma-y	SL / 4.3	27.47	4.3

(EPA 2016b)

Conversions
4,047 m2/acre

Grading

Activity Information

Operating schedule 208 day/yr

Grader Fleet

Equip. Cat.	Activity	
Grader Underground	3,994 hr/yr	25,958 VMT/yr
Grader Aboveground	1,820 hr/yr	11,830 VMT/yr

Grading Emission Factors

Emission Factor Equation	TSP (lb/VMT) = 0.04 $(S)^{2.5}$	*(EPA 1995), Tab. 11.9-1, 07/98, (grading)*
	PM15 (lb/VMT) = 0.051 $(S)^{2}$	*(EPA 1995), Tab. 11.9-1, 07/98, (grading)*
S - Grader average speed	6.5 mph	*(Caterpillar 2018), Road Maintenance, page 11-6, average*
TSP(PM)	4.31 lb/VMT	*Using emission factor eqyattion above.*
PM15	2.15 lb/VMT	*Using emission factor eqyattion above.*

Grading PM Scaling Factors

PM10	0.6	*(EPA 1995), Tab. 11.9-1, 07/98, (applies to PM15 EF, footnote d)*
PM2.5	0.031	*(EPA 1995), Tab. 11.9-1, 07/98, (applies to TSP EF, footnote e)*

Emission Controls

Grading

Aboveground Control efficiency:	90%	*See Onsite Hauling (Aboveground)*
Underground Control efficiency:	95%	*See Onsite Hauling (Underground)*

Emissions by Model ID

		PM_PPD	PM_TPY	PM10_PPD	PM10_TPY	PM2.5_PPD	PM2.5_TPY
		PM	PM	PM10		PM2.5	
Area ID	Activity	lb/day	ton/yr	lb/day	ton/yr	lb/day	ton/yr
UG	Grading	26.89	2.80	8.07	0.84	0.83	8.7E-2
HR	Grading	24.51	2.55	7.35	0.76	0.76	7.9E-2

See worksheet ROADS for haul road (HR) emissions by Model ID.

Source Parameters [1]

		TYPE	UTM_E	UTM_N	ELEV_M	FLOW_MPS	DIA_M	TEMP_K	RELHT_M	SIG_Y_M	SIG_Z_M
		Source	UTM NAD 83		Elev.	Flow	Dia.	Temp	Ht	S-y	S-z
Model ID	Activity	Type	E m	N m	m	mps	m	K	m	m	m
HR	Haul Roads	LINE	*See worksheet: ROADS*						2.25	9.88	2.10
UG	Underground	POINT	471,034	4,835,236	1,209	20.98	3.66	298.15	3		

[1] *UTM, Elev. - (Wolverson 2019.03.17); Stack Params: (Auscenco 2020) pages 254-255*

Conversions

2,000 lb/ton

Water Truck Travel

Activity Information

Operating schedule 260 day/yr

Truck Fleet

Water Truck	Payload Capacity ton	Empty Weight ton	Gross Weight ton	Units	Reference	Average Weight ton
CAT 777G	100	80	180	1	*(Caterpillar 2018)*	130

Total vehicle miles traveled (VMT) 3,974 VMT/yr 4 passes/day (max) 1.91 mi, aboveground haul roads
3.82 mi (round trip), aboveground haul roads

Emission Factors

Emission factor equation $E = k(s/12)^a (W/3)^b [(365-P)/365]$ *(EPA 1995), Tab. 13.2.2-2, Eqs. 1a and 2, 11/06*

s = Surface material silt content 5.8 % *(EPA 1995), Tab. 13.2.2-1 Taconite Mining*

W = Mean vehicle weight 130 ton

P = Days/year with ≥0.01 in precip. 90 day/yr *(EPA 1995), Fig. 13.2.2-1, 11/06*

	PM	PM10	PM2.5		
k = Size-specific empirical constant	4.9	1.5	0.15		*AP-42, Tab. 13.2.2-2, Eqs. 1a and 2, 11/06*
a = Size-specific empirical constant	0.7	0.9	0.9		*AP-42, Tab. 13.2.2-2, Eqs. 1a and 2, 11/06*
b = Size-specific empirical constant	0.45	0.45	0.45		*AP-42, Tab. 13.2.2-2, Eqs. 1a and 2, 11/06*
E = Size-specific emission factor	12.11	3.20	0.32	lb/VMT	

Emission Controls

Periodic application of water and chemical dust suppressant

Control efficiency: 90% *See Onsite Hauling (Aboveground)*

Emissions by Area

		PM_PPD	PM_TPY	PM10_PPD	PM10_TPY	PM2.5_PPD	PM2.5_TPY
		PM	PM	PM10		PM2.5	
Area ID	Activity	lb/day	ton/yr	lb/day	ton/yr	lb/day	ton/yr
HR	Water Truck Travel	18.50	2.41	4.90	0.64	0.49	6.4E-2

Source Parameters

Source Parameters [1]

		TYPE	UTM_E	UTM_N	ELEV_M	RELHT_M	SIG_Y_M	SIG_Z_M
		Source	UTM NAD 83		Elev.	Rel. Ht.	S-y	S-z
Model ID	Activity	Type	E m	N m	m	m	m	m
HR	Aboveground Hauling	LINE	*See worksheet: ROADS*			2.25	9.88	2.10

UTM, Elev. - (EPA 2012)

Conversions

2,000 lb/ton

Wind Erosion

Activity Information

Operating schedule 260 day/yr

Erodible Area

Model ID	Location of Activity	Surface Type	Unload ton/yr	Erodible Area (acre/yr)[2] Flat	Pile	Surface Footprint
WRSF	WRSF	Pile	248,500		49.5	13.9
STK	Ore Stockpile	Pile	289,700		57.8	0.2
BRW	Borrow Stockpile	Pile	247,000		49.2	0.2
CRF	CRF Stockpile	Pile	248,500		49.5	0.1
TS1	Topsoil Storage 1	Pile	0		7.1	7.1
TS2	Topsoil Storage 2	Pile	0		3.0	3.0

[1] *Based on total haul road length of* 2,152 *m* *(Wolverson 2019.03.17)* *and width of* 15.2 *m* *(Wolverson 2019.03.17)*

[2] *Pile surface area calculations:*

Truck dump (TD) size	29.5	ton	
Material density	140.0	lb/ft^3	
	0.070	ton/ft^3	*(Dyer 2019.04.26)*
Material specific volume	14.3	ft^3/ton	
TD volume (V)	421	ft^3	
Conical surface calculations			
Side slope	38	deg	
	0.7	rad	
Conical surface area (SA)	Π × r × (h^2 + r^2)^0.5		
Conical volume (V)	(Π × h × r^2) ÷ 3		
Conical base radius	r =	s × cos(slope)	
Conical height	h =	s × sin(slope)	
Sloped side length	s =	(h^2 + r^2)^0.5	
Solution of conical volume equation			
Replacing h and r with s × sin(slope) and s × cos(slope), respectively:			
s = [3 × V/(pi × sin(slope) × cos^2(slope)]^(1/3)	10.2	ft	
r	8.0	ft	
h	6.3	ft	
SA	256	ft^2	
	0.006	acre	
	2.0E-4	acre/ton-TD	

Scaling Factors

PM10	0.5	*(EPA 1995), Pg. 13.2.5-3, 11/06*
PM2.5	0.075	*(EPA 1995), Pg. 13.2.5-3, 11/06*

Conversions

4,046.86	m^2/acre
43,560	ft^2/acre
1609.34	m/mi
3.28084	ft/m
2,000	lb/ton

Wind Erosion - continued ***Wind erosion potential calculations based on Sep-2014 through Sep-2015 Grassy Mtn on site meteorological data***

Stockpile Surface Wind Erosion Event Emission Calculations

Based on 1 acre/yr 8,760 hr/yr 0.00011 acre/hr

Threshold Wind Event	Date / Hour	u10 (m/s) (1)	u10+ (m/s) (2)	u* (m/s) ID-A (3)	u* (m/s) ID-B (3)	u* (m/s) ID-C (3)	Hours Elapsed ID-A (4)	Hours Elapsed ID-B (4)	Hours Elapsed ID-C (4)	Erodible Surface Area (acre) ID-A (5)	Erodible Surface Area (acre) ID-B (5)	Erodible Surface Area (acre) ID-C (5)
0	9/25/2014 21:00											
1	10/15/2014 09:00	11.300	13.560	1.220	0.814	0.271	468	468	468	6.4E-3	2.6E-2	2.1E-2
2	10/15/2014 10:00	11.700	14.040	1.264	0.842	0.281	1	469	469	1.4E-5	2.6E-2	2.1E-2
3	10/15/2014 13:00	10.200	12.240	1.102	0.734	0.245	3	472	472	4.1E-5	2.6E-2	2.2E-2
4	10/15/2014 14:00	11.000	13.200	1.188	0.792	0.264	1	473	473	1.4E-5	2.6E-2	2.2E-2
5	10/20/2014 21:00	12.700	15.240	1.372	0.914	0.305	127	600	600	1.7E-3	3.3E-2	2.7E-2
6	10/20/2014 22:00	11.400	13.680	1.231	0.821	0.274	1	601	601	1.4E-5	3.3E-2	2.7E-2
7	10/20/2014 23:00	10.900	13.080	1.177	0.785	0.262	1	602	602	1.4E-5	3.3E-2	2.7E-2
8	10/21/2014 00:00	10.300	12.360	1.112	0.742	0.247	1	603	603	1.4E-5	3.3E-2	2.8E-2
9	10/25/2014 16:00	12.200	14.640	1.318	0.878	0.293	112	715	715	1.5E-3	3.9E-2	3.3E-2
10	10/25/2014 17:00	13.100	15.720	1.415	0.943	0.314	1	716	716	1.4E-5	3.9E-2	3.3E-2
11	10/25/2014 18:00	10.200	12.240	1.102	0.734	0.245	1	717	717	1.4E-5	3.9E-2	3.3E-2
12	10/25/2014 22:00	11.400	13.680	1.231	0.821	0.274	4	721	721	5.5E-5	4.0E-2	3.3E-2
13	10/25/2014 23:00	12.200	14.640	1.318	0.878	0.293	1	722	722	1.4E-5	4.0E-2	3.3E-2
14	10/26/2014 00:00	11.200	13.440	1.210	0.806	0.269	1	723	723	1.4E-5	4.0E-2	3.3E-2
15	10/26/2014 01:00	11.300	13.560	1.220	0.814	0.271	1	724	724	1.4E-5	4.0E-2	3.3E-2
16	11/1/2014 14:00	9.600	11.520	1.037	0.691	0.230	157	881	881	2.2E-3	4.8E-2	4.0E-2
17	11/1/2014 15:00	10.700	12.840	1.156	0.770	0.257	1	882	882	1.4E-5	4.8E-2	4.0E-2
18	11/22/2014 18:00	10.200	12.240	1.102	0.734	0.245	507	1,389	1,389	6.9E-3	7.6E-2	6.3E-2
19	11/22/2014 19:00	10.200	12.240	1.102	0.734	0.245	1	1,390	1,390	1.4E-5	7.6E-2	6.3E-2
20	11/23/2014 13:00	9.500	11.400	1.026	0.684	0.228	18	1,408	1,408	2.5E-4	7.7E-2	6.4E-2
21	11/23/2014 15:00	9.900	11.880	1.069	0.713	0.238	2	1,410	1,410	2.7E-5	7.7E-2	6.4E-2
22	11/28/2014 14:00	10.400	12.480	1.123	0.749	0.250	119	1,529	1,529	1.6E-3	8.4E-2	7.0E-2
23	11/28/2014 15:00	12.400	14.880	1.339	0.893	0.298	1	1,530	1,530	1.4E-5	8.4E-2	7.0E-2
24	11/28/2014 16:00	9.600	11.520	1.037	0.691	0.230	1	1,531	1,531	1.4E-5	8.4E-2	7.0E-2
25	11/28/2014 17:00	9.900	11.880	1.069	0.713	0.238	1	1,532	1,532	1.4E-5	8.4E-2	7.0E-2
26	11/29/2014 09:00	9.800	11.760	1.058	0.706	0.235	16	1,548	1,548	2.2E-4	8.5E-2	7.1E-2
27	12/21/2014 01:00	10.600	12.720	1.145	0.763	0.254	520	2,068	2,068	7.1E-3	1.1E-1	9.4E-2
28	12/21/2014 02:00	14.800	17.760	1.598	1.066	0.355	1	1	2,069	1.4E-5	5.5E-5	9.4E-2
29	12/21/2014 03:00	15.000	18.000	1.620	1.080	0.360	1	1	2,070	1.4E-5	5.5E-5	9.5E-2
30	12/21/2014 04:00	15.200	18.240	1.642	1.094	0.365	1	1	2,071	1.4E-5	5.5E-5	9.5E-2
31	12/21/2014 05:00	15.100	18.120	1.631	1.087	0.362	1	1	2,072	1.4E-5	5.5E-5	9.5E-2
32	12/21/2014 06:00	12.400	14.880	1.339	0.893	0.298	1	2	2,073	1.4E-5	1.1E-4	9.5E-2
33	12/21/2014 07:00	10.000	12.000	1.080	0.720	0.240	1	3	2,074	1.4E-5	1.6E-4	9.5E-2
34	12/21/2014 08:00	9.800	11.760	1.058	0.706	0.235	1	4	2,075	1.4E-5	2.2E-4	9.5E-2
35	12/24/2014 19:00	9.800	11.760	1.058	0.706	0.235	83	87	2,158	1.1E-3	4.8E-3	9.9E-2
36	12/24/2014 20:00	9.700	11.640	1.048	0.698	0.233	1	88	2,159	1.4E-5	4.8E-3	9.9E-2
37	12/25/2014 07:00	11.500	13.800	1.242	0.828	0.276	11	99	2,170	1.5E-4	5.4E-3	9.9E-2
38	12/25/2014 08:00	9.700	11.640	1.048	0.698	0.233	1	100	2,171	1.4E-5	5.5E-3	9.9E-2
39	2/6/2015 17:00	11.800	14.160	1.274	0.850	0.283	1,041	1,141	3,212	1.4E-2	6.3E-2	1.5E-1
40	2/6/2015 20:00	10.600	12.720	1.145	0.763	0.254	3	1,144	3,215	4.1E-5	6.3E-2	1.5E-1
41	2/7/2015 00:00	10.000	12.000	1.080	0.720	0.240	4	1,148	3,219	5.5E-5	6.3E-2	1.5E-1

Wind Erosion - continued ***Wind erosion potential calculations based on Sep-2014 through Sep-2015 Grassy Mtn on site meteorological data***

Stockpile Surface Wind Erosion Event Emission Calculations - continued
Based on 1 acre/yr 8,760 hr/yr 0.00011 acre/hr

Threshold Wind Event	Date / Hour	u10 (m/s) (1)	u10+ (m/s) (2)	u* (m/s) ID-A (3)	u* (m/s) ID-B (3)	u* (m/s) ID-C (3)	Hours Elapsed ID-A (4)	Hours Elapsed ID-B (4)	Hours Elapsed ID-C (4)	Erodible Surface Area (acre) ID-A (5)	Erodible Surface Area (acre) ID-B (5)	Erodible Surface Area (acre) ID-C (5)
42	2/7/2015 06:00	10.100	12.120	1.091	0.727	0.242	6	1,154	3,225	8.2E-5	6.3E-2	0.14726
43	2/7/2015 11:00	15.100	18.120	1.631	1.087	0.362	5	5	3,230	6.8E-5	2.7E-4	0.14749
44	2/7/2015 12:00	15.400	18.480	1.663	1.109	0.370	1	1	3,231	1.4E-5	5.5E-5	0.14753
45	2/7/2015 13:00	12.700	15.240	1.372	0.914	0.305	1	2	3,232	1.4E-5	1.1E-4	0.14758
46	2/7/2015 14:00	11.800	14.160	1.274	0.850	0.283	1	3	3,233	1.4E-5	1.6E-4	0.14763
47	2/7/2015 15:00	11.700	14.040	1.264	0.842	0.281	1	4	3,234	1.4E-5	2.2E-4	0.14767
48	2/7/2015 16:00	10.600	12.720	1.145	0.763	0.254	1	5	3,235	1.4E-5	2.7E-4	0.14772
49	2/7/2015 17:00	10.000	12.000	1.080	0.720	0.240	1	6	3,236	1.4E-5	3.3E-4	0.14776
50	2/9/2015 16:00	10.000	12.000	1.080	0.720	0.240	47	53	3,283	6.4E-4	2.9E-3	0.14991
51	2/9/2015 17:00	10.100	12.120	1.091	0.727	0.242	1	54	3,284	1.4E-5	3.0E-3	0.14995
52	2/21/2015 17:00	9.800	11.760	1.058	0.706	0.235	288	342	3,572	3.9E-3	1.9E-2	0.16311
53	3/11/2015 13:00	11.000	13.200	1.188	0.792	0.264	428	770	4,000	5.9E-3	4.2E-2	0.18265
54	3/15/2015 21:00	12.500	15.000	1.350	0.900	0.300	104	874	4,104	1.4E-3	4.8E-2	0.18740
55	3/15/2015 22:00	14.500	17.400	1.566	1.044	0.348	1	1	4,105	1.4E-5	5.5E-5	0.18744
56	3/15/2015 23:00	11.900	14.280	1.285	0.857	0.286	1	2	4,106	1.4E-5	1.1E-4	0.18749
57	3/16/2015 00:00	12.500	15.000	1.350	0.900	0.300	1	3	4,107	1.4E-5	1.6E-4	0.18753
58	3/21/2015 10:00	10.400	12.480	1.123	0.749	0.250	130	133	4,237	1.8E-3	7.3E-3	0.19347
59	3/21/2015 12:00	11.100	13.320	1.199	0.799	0.266	2	135	4,239	2.7E-5	7.4E-3	0.19356
60	3/21/2015 13:00	11.400	13.680	1.231	0.821	0.274	1	136	4,240	1.4E-5	7.5E-3	0.19361
61	3/23/2015 02:00	11.400	13.680	1.231	0.821	0.274	37	173	4,277	5.1E-4	9.5E-3	0.19530
62	3/23/2015 03:00	11.200	13.440	1.210	0.806	0.269	1	174	4,278	1.4E-5	9.5E-3	0.19534
63	3/23/2015 04:00	10.900	13.080	1.177	0.785	0.262	1	175	4,279	1.4E-5	9.6E-3	0.19539
64	3/23/2015 11:00	9.500	11.400	1.026	0.684	0.228	7	182	4,286	9.6E-5	1.0E-2	0.19571
65	3/23/2015 12:00	9.600	11.520	1.037	0.691	0.230	1	183	4,287	1.4E-5	1.0E-2	0.19575
66	3/28/2015 02:00	10.200	12.240	1.102	0.734	0.245	110	293	4,397	1.5E-3	1.6E-2	0.20078
67	3/28/2015 03:00	10.900	13.080	1.177	0.785	0.262	1	294	4,398	1.4E-5	1.6E-2	0.20082
68	3/28/2015 06:00	11.800	14.160	1.274	0.850	0.283	3	297	4,401	4.1E-5	1.6E-2	0.20096
69	3/31/2015 15:00	10.100	12.120	1.091	0.727	0.242	81	378	4,482	1.1E-3	2.1E-2	0.20466
70	3/31/2015 16:00	9.700	11.640	1.048	0.698	0.233	1	379	4,483	1.4E-5	2.1E-2	0.20470
71	4/14/2015 03:00	11.300	13.560	1.220	0.814	0.271	323	702	4,806	4.4E-3	3.8E-2	0.21945
72	4/14/2015 04:00	10.800	12.960	1.166	0.778	0.259	1	703	4,807	1.4E-5	3.9E-2	0.21950
73	4/14/2015 10:00	10.100	12.120	1.091	0.727	0.242	6	709	4,813	8.2E-5	3.9E-2	0.21977
74	4/14/2015 12:00	9.600	11.520	1.037	0.691	0.230	2	711	4,815	2.7E-5	3.9E-2	0.21986
75	4/14/2015 17:00	10.400	12.480	1.123	0.749	0.250	5	716	4,820	6.8E-5	3.9E-2	0.22009
76	4/15/2015 16:00	9.700	11.640	1.048	0.698	0.233	23	739	4,843	3.2E-4	4.0E-2	0.22114
77	5/12/2015 19:00	10.400	12.480	1.123	0.749	0.250	651	1,390	5,494	8.9E-3	7.6E-2	0.25087
78	5/12/2015 20:00	14.700	17.640	1.588	1.058	0.353	1	1	5,495	1.4E-5	5.5E-5	0.25091
79	5/12/2015 21:00	12.900	15.480	1.393	0.929	0.310	1	2	5,496	1.4E-5	1.1E-4	0.25096
80	6/21/2015 18:00	10.500	12.600	1.134	0.756	0.252	957	959	6,453	1.3E-2	5.3E-2	0.29466
81	6/21/2015 19:00	9.500	11.400	1.026	0.684	0.228	1	960	6,454	1.4E-5	5.3E-2	0.29470
82	6/29/2015 01:00	9.700	11.640	1.048	0.698	0.233	174	1,134	6,628	2.4E-3	6.2E-2	0.30265
83	6/29/2015 02:00	11.200	13.440	1.210	0.806	0.269	1	1,135	6,629	1.4E-5	6.2E-2	0.30269

Wind Erosion - continued ***Wind erosion potential calculations based on Sep-2014 through Sep-2015 Grassy Mtn on site meteorological data***

Stockpile Surface Wind Erosion Event Emission Calculations - continued

Based on 1 acre/yr 8,760 hr/yr 0.00011 acre/hr

Threshold Wind Event	Date / Hour	u10 (m/s) (1)	u10+ (m/s) (2)	u* (m/s) ID-A (3)	u* (m/s) ID-B (3)	u* (m/s) ID-C (3)	Hours Elapsed ID-A (4)	Hours Elapsed ID-B (4)	Hours Elapsed ID-C (4)	Erodible Surface Area (acre) ID-A (5)	Erodible Surface Area (acre) ID-B (5)	Erodible Surface Area (acre) ID-C (5)
84	7/5/2015 07:00	9.600	11.520	1.037	0.691	0.230	149	1,284	6,778	2.0E-3	7.0E-2	0.30950
85	7/5/2015 08:00	10.600	12.720	1.145	0.763	0.254	1	1,285	6,779	1.4E-5	7.0E-2	0.30954
86	7/5/2015 09:00	10.600	12.720	1.145	0.763	0.254	1	1,286	6,780	1.4E-5	7.0E-2	0.30959
87	7/5/2015 10:00	9.500	11.400	1.026	0.684	0.228	1	1,287	6,781	1.4E-5	7.1E-2	0.30963
88	7/5/2015 16:00	10.200	12.240	1.102	0.734	0.245	6	1,293	6,787	8.2E-5	7.1E-2	0.30991
89	7/8/2015 14:00	10.200	12.240	1.102	0.734	0.245	70	1,363	6,857	9.6E-4	7.5E-2	0.31311
90	7/8/2015 15:00	10.600	12.720	1.145	0.763	0.254	1	1,364	6,858	1.4E-5	7.5E-2	0.31315
91	7/8/2015 19:00	10.600	12.720	1.145	0.763	0.254	4	1,368	6,862	5.5E-5	7.5E-2	0.31333
92	7/9/2015 23:00	10.700	12.840	1.156	0.770	0.257	28	1,396	6,890	3.8E-4	7.6E-2	0.31461
93	7/10/2015 00:00	10.000	12.000	1.080	0.720	0.240	1	1,397	6,891	1.4E-5	7.7E-2	0.31466
94	7/21/2015 21:00	9.900	11.880	1.069	0.713	0.238	285	1,682	7,176	3.9E-3	9.2E-2	0.32767
95	8/3/2015 02:00	9.900	11.880	1.069	0.713	0.238	293	1,975	7,469	4.0E-3	1.1E-1	0.34105
96	8/3/2015 03:00	15.400	18.480	1.663	1.109	0.370	1	1	7,470	1.4E-5	5.5E-5	0.34110
97	8/3/2015 04:00	13.600	16.320	1.469	0.979	0.326	1	2	7,471	1.4E-5	1.1E-4	0.34114
98	8/3/2015 05:00	11.500	13.800	1.242	0.828	0.276	1	3	7,472	1.4E-5	1.6E-4	0.34119
99	8/4/2015 00:00	10.500	12.600	1.134	0.756	0.252	19	22	7,491	2.6E-4	1.2E-3	0.34205
100	8/14/2015 18:00	9.600	11.520	1.037	0.691	0.230	258	280	7,749	3.5E-3	1.5E-2	0.35384
101	8/14/2015 19:00	9.800	11.760	1.058	0.706	0.235	1	281	7,750	1.4E-5	1.5E-2	0.35388
102	8/29/2015 12:00	10.200	12.240	1.102	0.734	0.245	353	634	8,103	4.8E-3	3.5E-2	0.37000
103	8/29/2015 14:00	11.000	13.200	1.188	0.792	0.264	2	636	8,105	2.7E-5	3.5E-2	0.37009
104	8/29/2015 15:00	10.100	12.120	1.091	0.727	0.242	1	637	8,106	1.4E-5	3.5E-2	0.37014
105	9/4/2015 17:00	11.700	14.040	1.264	0.842	0.281	146	783	8,252	2.0E-3	4.3E-2	0.37680
106	9/4/2015 18:00	12.700	15.240	1.372	0.914	0.305	1	784	8,253	1.4E-5	4.3E-2	0.37685

Flat Surface Wind Erosion Event Emission Calculations

Threshold Wind Event	Date / Hour	u10 (m/s) (1)	u10+ (m/s) (2)	u* (m/s) Flat (3)	Hours Elapsed Flat (4)	Erodible Surface Area (acre) Flat (5)
N/A	No wind events above 16.04 m/s					

Wind Erosion - continued

Stockpile Surface Wind Erosion Event Emission Calculations - continued

Threshold Wind Event	Erosion Potential (lb/acre)[1] ID-A (6)	ID-B (6)	ID-C (6)	PM Emissions (lb) ID-A (7)	ID-B (7)	ID-C (7)	Total (8)	PM10 (lb) Total (9)	PM2.5 (lb) Total (10)
1	65.48	--	--	4.2E-1	--	--	0.420	0.210	3.1E-2
2	85.04	--	--	1.2E-3	--	--	1.2E-3	5.8E-4	8.7E-5
3	21.65	--	--	8.9E-4	--	--	8.9E-4	4.4E-4	6.7E-5
4	52.08	--	--	7.1E-4	--	--	7.1E-4	3.6E-4	5.4E-5
5	142.4	--	--	2.5E-1	--	--	0.248	0.124	1.9E-2
6	70.19	--	--	9.6E-4	--	--	9.6E-4	4.8E-4	7.2E-5
7	47.85	--	--	6.6E-4	--	--	6.6E-4	3.3E-4	4.9E-5
8	25.03	--	--	3.4E-4	--	--	3.4E-4	1.7E-4	2.6E-5
9	112.21	--	--	1.7E-1	--	--	0.172	8.6E-2	1.3E-2
10	168.71	--	--	2.3E-3	--	--	2.3E-3	1.2E-3	1.7E-4
11	21.65	--	--	3.0E-4	--	--	3.0E-4	1.5E-4	2.2E-5
12	70.19	--	--	3.8E-3	--	--	3.8E-3	1.9E-3	2.9E-4
13	112.21	--	--	1.5E-3	--	--	1.5E-3	7.7E-4	1.2E-4
14	60.89	--	--	8.3E-4	--	--	8.3E-4	4.2E-4	6.3E-5
15	65.48	--	--	9.0E-4	--	--	9.0E-4	4.5E-4	6.7E-5
16	3.89	--	--	8.4E-3	--	--	8.4E-3	4.2E-3	6.3E-4
17	39.76	--	--	5.4E-4	--	--	5.4E-4	2.7E-4	4.1E-5
18	21.65	--	--	1.5E-1	--	--	0.150	7.5E-2	1.1E-2
19	21.65	--	--	3.0E-4	--	--	3.0E-4	1.5E-4	2.2E-5
20	1.36	--	--	3.3E-4	--	--	3.3E-4	1.7E-4	2.5E-5
21	12.23	--	--	3.3E-4	--	--	3.3E-4	1.7E-4	2.5E-5
22	28.53	--	--	4.7E-2	--	--	4.7E-2	2.3E-2	3.5E-3
23	123.92	--	--	1.7E-3	--	--	1.7E-3	8.5E-4	1.3E-4
24	3.89	--	--	5.3E-5	--	--	5.3E-5	2.7E-5	4.0E-6
25	12.23	--	--	1.7E-4	--	--	1.7E-4	8.4E-5	1.3E-5
26	9.33	--	--	2.0E-3	--	--	2.0E-3	1.0E-3	1.5E-4
27	35.90	--	--	2.6E-1	--	--	0.256	0.128	1.9E-2
28	302.12	11	--	4.1E-3	6.2E-4	--	4.8E-3	2.4E-3	3.6E-4
29	320.11	15	--	4.4E-3	8.4E-4	--	5.2E-3	2.6E-3	3.9E-4
30	338.59	19	--	4.6E-3	1.1E-3	--	5.7E-3	2.9E-3	4.3E-4
31	329.29	17	--	4.5E-3	9.5E-4	--	5.5E-3	2.7E-3	4.1E-4
32	123.92	--	--	1.7E-3	--	--	1.7E-3	8.5E-4	1.3E-4
33	15.25	--	--	2.1E-4	--	--	2.1E-4	1.0E-4	1.6E-5
34	9.33	--	--	1.3E-4	--	--	1.3E-4	6.4E-5	9.6E-6
35	9.33	--	--	1.1E-2	--	--	1.1E-2	5.3E-3	8.0E-4
36	6.55	--	--	9.0E-5	--	--	9.0E-5	4.5E-5	6.7E-6
37	75.02	--	--	1.1E-2	--	--	1.1E-2	5.7E-3	8.5E-4
38	6.55	--	--	9.0E-5	--	--	9.0E-5	4.5E-5	6.7E-6
39	90.23	--	--	1.3E+0	--	--	1.287	0.643	9.7E-2
40	35.90	--	--	1.5E-3	--	--	1.5E-3	7.4E-4	1.1E-4
41	15.25	--	--	8.4E-4	--	--	8.4E-4	4.2E-4	6.3E-5
Stockpile Subtotal							2.655	1.327	0.199

Wind Erosion - continued

Stockpile Surface Wind Erosion Event Emission Calculations - continued

Threshold	Erosion Potential (lb/acre)[1]			PM Emissions (lb)				PM10 (lb)	PM2.5 (lb)
Wind Event	ID-A (6)	ID-B (6)	ID-C (6)	ID-A (7)	ID-B (7)	ID-C (7)	Total (8)	Total (9)	Total (10)
42	18.39	--	--	1.5E-3	--	--	1.5E-3	7.6E-4	1.1E-4
43	329.29	17	--	2.3E-2	4.7E-3	--	2.7E-2	1.4E-2	2.0E-3
44	357.54	24	--	4.9E-3	1.3E-3	--	6.2E-3	3.1E-3	4.7E-4
45	142.39	--	--	2.0E-3	--	--	2.0E-3	9.8E-4	1.5E-4
46	90.23	--	--	1.2E-3	--	--	1.2E-3	6.2E-4	9.3E-5
47	85.0	--	--	1.2E-3	--	--	1.2E-3	5.8E-4	8.7E-5
48	35.90	--	--	4.9E-4	--	--	4.9E-4	2.5E-4	3.7E-5
49	15.25	--	--	2.1E-4	--	--	2.1E-4	1.0E-4	1.6E-5
50	15.25	--	--	9.8E-3	--	--	9.8E-3	4.9E-3	7.4E-4
51	18.39	--	--	2.5E-4	--	--	2.5E-4	1.3E-4	1.9E-5
52	9.33	--	--	3.7E-2	--	--	3.7E-2	1.8E-2	2.8E-3
53	52.08	--	--	0.305	--	--	0.305	0.153	2.3E-2
54	129.96	--	--	0.185	--	--	0.185	9.3E-2	1.4E-2
55	276.05	6	--	3.8E-3	3.1E-4	--	4.1E-3	2.0E-3	3.1E-4
56	95.55	--	--	1.3E-3	--	--	1.3E-3	6.5E-4	9.8E-5
57	129.96	--	--	1.8E-3	--	--	1.8E-3	8.9E-4	1.3E-4
58	28.53	--	--	5.1E-2	--	--	5.1E-2	2.5E-2	3.8E-3
59	56.42	--	--	1.5E-3	--	--	1.5E-3	7.7E-4	1.2E-4
60	70.19	--	--	9.6E-4	--	--	9.6E-4	4.8E-4	7.2E-5
61	70.19	--	--	3.6E-2	--	--	3.6E-2	1.8E-2	2.7E-3
62	60.89	--	--	8.3E-4	--	--	8.3E-4	4.2E-4	6.3E-5
63	47.85	--	--	6.6E-4	--	--	6.6E-4	3.3E-4	4.9E-5
64	1.36	--	--	1.3E-4	--	--	1.3E-4	6.5E-5	9.8E-6
65	3.89	--	--	5.3E-5	--	--	5.3E-5	2.7E-5	4.0E-6
66	21.65	--	--	3.3E-2	--	--	3.3E-2	1.6E-2	2.4E-3
67	47.85	--	--	6.6E-4	--	--	6.6E-4	3.3E-4	4.9E-5
68	90.23	--	--	3.7E-3	--	--	3.7E-3	1.9E-3	2.8E-4
69	18.39	--	--	2.0E-2	--	--	2.0E-2	1.0E-2	1.5E-3
70	6.55	--	--	9.0E-5	--	--	9.0E-5	4.5E-5	6.7E-6
71	65.48	--	--	0.290	--	--	0.290	0.145	2.2E-2
72	43.74	--	--	6.0E-4	--	--	6.0E-4	3.0E-4	4.5E-5
73	18.39	--	--	1.5E-3	--	--	1.5E-3	7.6E-4	1.1E-4
74	3.89	--	--	1.1E-4	--	--	1.1E-4	5.3E-5	8.0E-6
75	28.53	--	--	2.0E-3	--	--	2.0E-3	9.8E-4	1.5E-4
76	6.55	--	--	2.1E-3	--	--	2.1E-3	1.0E-3	1.5E-4
77	28.53	--	--	0.254	--	--	0.254	0.127	1.9E-2
78	293.31	9	--	4.0E-3	5.1E-4	--	4.5E-3	2.3E-3	3.4E-4
79	155.31	--	--	2.1E-3	--	--	2.1E-3	1.1E-3	1.6E-4
80	32.15	--	--	0.421	--	--	0.421	0.211	3.2E-2
81	1.36	--	--	1.9E-5	--	--	1.9E-5	9.3E-6	1.4E-6
82	6.55	--	--	1.6E-2	--	--	1.6E-2	7.8E-3	1.2E-3
83	60.89	--	--	8.3E-4	--	--	8.3E-4	4.2E-4	6.3E-5
Stockpile Subtotal							1.728	0.864	0.130

Wind Erosion - continued

Stockpile Surface Wind Erosion Event Emission Calculations - continued

Threshold Wind Event	Erosion Potential (lb/acre)[1] ID-A (6)	ID-B (6)	ID-C (6)	PM Emissions (lb) ID-A (7)	ID-B (7)	ID-C (7)	Total (8)	PM10 (lb) Total (9)	PM2.5 (lb) Total (10)
84	3.89	--	--	7.9E-3	--	--	7.9E-3	4.0E-3	6.0E-4
85	35.90	--	--	4.9E-4	--	--	4.9E-4	2.5E-4	3.7E-5
86	35.90	--	--	4.9E-4	--	--	4.9E-4	2.5E-4	3.7E-5
87	1.36	--	--	1.9E-5	--	--	1.9E-5	9.3E-6	1.4E-6
88	21.65	--	--	1.8E-3	--	--	1.8E-3	8.9E-4	1.3E-4
89	21.65	--	--	2.1E-2	--	--	2.1E-2	1.0E-2	1.6E-3
90	35.90	--	--	4.9E-4	--	--	4.9E-4	2.5E-4	3.7E-5
91	35.90	--	--	2.0E-3	--	--	2.0E-3	9.8E-4	1.5E-4
92	39.76	--	--	1.5E-2	--	--	1.5E-2	7.6E-3	1.1E-3
93	15.25	--	--	2.1E-4	--	--	2.1E-4	1.0E-4	1.6E-5
94	12.23	--	--	4.8E-2	--	--	4.8E-2	2.4E-2	3.6E-3
95	12.23	--	--	4.9E-2	--	--	4.9E-2	2.5E-2	3.7E-3
96	357.54	24	--	4.9E-3	1.3E-3	--	6.2E-3	3.1E-3	4.7E-4
97	204.33	--	--	2.8E-3	--	--	2.8E-3	1.4E-3	2.1E-4
98	75.02	--	--	1.0E-3	--	--	1.0E-3	5.1E-4	7.7E-5
99	32.15	--	--	8.4E-3	--	--	8.4E-3	4.2E-3	6.3E-4
100	3.89	--	--	1.4E-2	--	--	1.4E-2	6.9E-3	1.0E-3
101	9.33	--	--	1.3E-4	--	--	1.3E-4	6.4E-5	9.6E-6
102	21.65	--	--	0.105	--	--	0.105	5.2E-2	7.9E-3
103	52.08	--	--	1.4E-3	--	--	1.4E-3	7.1E-4	1.1E-4
104	18.39	--	--	2.5E-4	--	--	2.5E-4	1.3E-4	1.9E-5
105	85.04	--	--	0.170	--	--	0.170	8.5E-2	1.3E-2
106	142.39	--	--	2.0E-3	--	--	2.0E-3	9.8E-4	1.5E-4
Stockpile Subtotal							0.457	0.228	3.4E-2

Final Emission Factors (lb/acre-yr)

Surface Type	PM	PM10	PM2.5
Pile	4.84	2.42	0.36
Flat	--	--	--

Wind Erosion - continued

Stockpile Surface Wind Erosion Event Emission Calculations - Notes

(1) u10 = wind speed at 10 meters reference height, m/s

(2) u10+ = fastest-mile wind speed, m/s
Based on hourly to fastest-mile wind speed conversion factor of 1.2 *(EPA 1994)*

(3) Pile: u* = friction velocity, m/s = (us/ur) × 0.1 × u10+ *(EPA 1995), Sec. 13.2.5, Eqs. 6 & 7, 11/06*

Area ID	A	B	C	
(us/ur)	0.9	0.6	0.2	*(EPA 1995), Page 13.2.5-10, 11/06*

Flat surface:
u* = friction velocity, m/s = 0.053 × u10+ *(EPA 1995), Sec. 13.2.5, Eq. 4, 11/06*

(4) Hours elapsed since previous wind erosion event

(5) Erodible surface area = hours elapsed since previous erosion event × hourly erodible surface area (acre) × surface regime area fraction Surface regime area fractions:

Area ID	A	B	C	
% Surfac	0.12	0.48	0.4	*(EPA 1995), Page 13.2.5-10, 11/06*

(6) Erosion potential, g/m^2, = P = 58(u* - ut*)^2 + 25(u* - ut*); P = 0 for u* ≤ ut* *(EPA 1995), Page 13.2.5, Eq. 3, 11/06*
where, ut* = threshold friction velocity 1.02 m/s *(EPA 1995), Page 13.2.5-5 (overburden), 11/06*
P converted to lb/acre by multiplying with: 0.0022 lb/g and 4,046.86 m^2/acre
Solving u* = (us/ur) × 0.1 × u10+ for u10, when u* = ut* = 1.02 m/s and u10+ = u* × 1.2
yields the following minimum wind speeds to disturb each stockpile surface regime:
ID-A 9.44 m/s
ID-B 14.17 m/s
ID-C 42.50 m/s
The threshold wind speed to disturb flat surfaces is 1.02/0.053/1.2
Flat surface 16.04 m/s
The maximum hourly wind speed in the onsite data is 12.7 m/s, which is less than the threshold wind speeds to cause a disturbance of stockpile regimes ID-B and ID-C, and flat surfaces.

(7) PM emissions, lb = P (lb/acre) × erodible surface area (acre)

(8) Total PM emissions, lb = PM (ID-A), lb + PM (ID-B), lb + PM(ID-C), lb

(9) Total PM10 emissions, lb = total PM emissions, lb × PM10 scaling factors of 0.5 *(EPA 1995), Page 13.2.5-3, 11/06*

(10) Total PM2.5 emissions, lb = total PM emissions, lb × PM2.5 scaling factors of 0.075 *(EPA 1995), Page 13.2.5-3, 11/06*

Wind Erosion - continued

chk

Emissions by Model ID

				PM_PPD	PM_TPY	PM10_PPD	PM10_TPY	PM2.5_PPD	PM2.5_TPY
	Location of	Control[1]		PM	PM	PM10		PM2.5	
Model ID	Activity		Type	lb/yr	ton/yr	lb/day	ton/yr	lb/day	ton/yr
WRSF	WRSF	--	Pile	0.922	0.120	0.461	6.0E-2	6.9E-2	9.0E-3
STK	Ore Stockpile	--	Pile	1.075	0.140	0.538	7.0E-2	8.1E-2	1.0E-2
BRW	Borrow Stockpile	--	Pile	0.917	0.119	0.458	6.0E-2	6.9E-2	8.9E-3
CRF	CRF Stockpile	--	Pile	0.922	0.120	0.461	6.0E-2	6.9E-2	9.0E-3
TS1	Topsoil Storage 1	--	Pile	0.133	1.7E-2	6.7E-2	8.6E-3	1.0E-2	1.3E-3
TS2	Topsoil Storage 2	--	Pile	5.5E-2	7.1E-3	2.7E-2	3.6E-3	4.1E-3	5.4E-4
Total	Wind Erosion			4.024	0.523	2.012	0.262	0.302	3.9E-2

No wind events above 16.04 m/s - Threshold wind speed for flat surfaces

Source Parameters [1]

		TYPE	UTM_E	UTM_N	ELEV_M	RELHT_M	SIG_Z_M	SXINIT_M	SYINIT_M	ANGL_DEG
		Source	UTM NAD 83		Elev.	Rel. Ht.	S-z	X-init.	Y-init.	Angle
Model ID	Activity	Type	E m	N m	m	m	m^3	m	m	deg
TS1	*Topsoil Storage 1*	AREA	470,380	4,836,336	1,108	0	0	150.2	300.5	58.4
TS2	*Topsoil Storage 2*	AREA	470,138	4,835,247	1,084	0	0	144.1	144.1	0.0

[1] *UTM - (Air Sciences 2021); elev. - (Wolverson 2019.03.17); Rel. Ht. - (EPA 2012); Pit X, Pit Y, Angle - best-fit equal area rectangle*

Conversions
2,000 lb/ton

Underground Mobile Equipment (Tailpipes)

Operating schedul Underground schedule 208 day/yr 12 hrs/shift 2 shifts/day

Borrow schedule 260 day/yr 12 hr/day

Nonroad Mobile Equipment Specifications and Activity

Equipment[3,4+]	Equipment[1,3+] Model	ID	Rating hp	Rating kW	Oper. hr/yr	Equip.[5] Count	Diesel[1] gal/yr	Under-Ground[14]	Diesel - UG gal/yr	Output[2] kW-hr/yr
Dual drill and bolt	Resemin Tr	EQP1	97	72.4 [6]	2,995 [10]	3	4,792	95%	4,553	69,942
LHD 5.2 cubic yar	CAT R1600	EQP2	279 [1]	208	15,974 [10]	4	70,287	95%	66,773	1,025,820
Truck with ejector	CAT AD22	EQP3	325 [7]	242	11,981 [10]	3	62,300	71%	44,143	909,249
Emulsion loader	CAT 440	EQP4	104 [8]	78	3,994 [10]	1	6,789	70%	4,752	99,085
Telehandler	JCB 540-17(	EQP5	130 [9]	97	7,987 [10]	2	16,773	70%	11,741	244,798
Motor grader	Paus PG5H	EQP6	101	75 [10]	3,994 [10]	1	6,390	95%	6,070	93,256
Shotcrete sprayer	Normet Spr	EQP9	100	75 [11]	998	1	1,597	95%	1,518	23,314
Shotcrete truck	Normet Uti	EQP10	129	96 [12]	3,994 [10]	1	8,387	85%	7,130	122,399
Lube truck	Normet Mu	EQP11	148	110 [13]	3,994 [10]	1	9,185	95%	8,726	134,056
Water Truck	Normet Mu	EQP12	148	110 [13]	3,994 [10]	1	9,185	95%	8,726	134,056

[1] *(Caterpillar 2018) and project total fuel cost*

[2] *Based on: 137,000 Btu/gal (EPA 1995), App. A (Diesel) 7,000 Btu/hp-hr (EPA 1995), Sec. 3.3, (Diesel)*

[3] *(MDA 2018) pp. 166, 167, 217*

[4] *(Dyer 2019.03.29)*

[5] *(Seamons 2021.06.18)*

[6] *(Resemin 2021)*

[7] *(Caterpillar 2021b)*

[8] *(Caterpillar 2021a)*

[9] *(JCB 2021)*

[10] *(Paus 2013)*

[11] *(Normet 2021a)*

[12] *(Normet 2021b)*

[13] *(Normet 2021c)*

[14] *(Grassy Mountain 2021)*

Mine Equipment Utilization Rate:	*80%*	*(Seamons 2021.06.18)*	
Underground drilling equipment tramming time:	*25%*	*(Seamons 2021.06.18)*	
Water Truck Utilization:	*12*	mph	
	4	passes/day (max)	
	8.37	mi (round trip), aboveground ha	*(Wolverson 2019.03.17)*
	8,701	VMT/yr	
Pickup/Van Utilization:	*50%*	*Air Sciences recommendation*	*(Li et al. 2008)*

Conversions

7.05	lb/gal distillate oil
1.341	hp/kW
0.00939	MMBtu/kW-hr
453.59	g/lb
0.2642	gal/L

Underground Mobile Equipment (Tailpipes) - continued
Operating schedule

EPA Non-Road Standards

ID	Equipment Type	Model[1] Year	Power Category	EPA Tier	Lookup ID	EPA Non-Road Standards (g/kW-hr)[2] PM	CO	NOX	VOC
EQP1	Drill	>2004	56≤kW<75, Ph-in	2	§89-37≤kW<75 2004	0.4	5	7.5	7.5
EQP2	Loader	≥2006	130≤kW<225, ≤201	3	§89-130≤kW<225 2006	0.2	3.5	4	4
EQP3	Haul Truck	>2006	225≤kW<450, ≤201	3	§89-225≤kW<450 2006	0.2	3.5	4	4
EQP4	Support Truck	>2015	75≤kW<130, Ph-in	4	T4-56≤kW<130 2015	0.02	5	0.4	0.19
EQP5	Forklift	>2007	75≤kW<130, ≤2011	3	§89-75≤kW<130 2007	0.3	5	4	4
EQP6	Grader	>2018	75≤kW<130, Ph-in	4	T4-56≤kW<130 2015	0.02	5	0.4	0.19
EQP9	Support Truck	>2007	75≤kW<130, ≤2011	3	§89-75≤kW<130 2007	0.3	5	4	4
EQP10	Support Truck	>2007	75≤kW<130, ≤2011	3	§89-75≤kW<130 2007	0.3	5	4	4
EQP11	Support Truck	>2007	75≤kW<130, ≤2011	3	§89-75≤kW<130 2007	0.3	5	4	4
EQP12	Support Truck	>2018	75≤kW<130, Ph-in	4	T4-56≤kW<130 2015	0.02	5	0.4	0.19

[1] *(Dyer 2019.04.19)*

[2] *(CFR 2017)*

Underground Mobile Equipment (Tailpipes) - continued
Fuel Sulfur-Content Based SO2 Emission Factor

Fuel Sulfur-Content	0.0015%		*Non-road diesel specification per 40 CFR 80.510*
Diesel Density	7.05	lb/gal	*(EPA 1994), App. A*
Molecular Wt. of SO2	64.064	lb/lb-mol	
Molecular Wt. of S	32.065	lb/lb-mol	
Diesel Heat Content	137,000	Btu/gal	*(EPA 1995), App. A (Diesel)*
Brake-Specific Fuel Use	7,000	Btu/hp-hr	*(EPA 1995), Sec. 3.3, (Diesel)*

SO2 emission factor:

$$\frac{0.0015\%\ \text{lb S}}{\text{lb Fuel}} \times \frac{7.05\ \text{lb Fuel}}{\text{gal Fuel}} \times \frac{64.064\ \text{lb SO2}}{32.065\ \text{lb S}} \times \frac{\text{gal Fuel}}{137{,}000\ \text{BTU}} \times \frac{7{,}000\ \text{BTU}}{\text{hp-hr}} = 0.000011\ \text{lb/hp-hr}$$

$$\frac{0.000011\ \text{lb}}{\text{hp-hr}} \times \frac{1.341\ \text{hp}}{\text{kW}} \times \frac{453.593\ \text{g}}{\text{lb}} = 0.006567\ \text{g/kW-hr}$$

Conversions
1.341 hp/kW
453.593 g/lb

Underground Mobile Equipment (Tailpipes) - continued

Final Emission Factors

ID	Lookup	PM g/kW-hr	PM10 g/kW-hr	PM2.5 g/kW-hr	CO g/kW-hr	NOX g/kW-hr	VOC g/kW-hr	SO2 g/kW-hr	Activity kW-hr/yr
EQP1	§89-37≤kW<75 2004	0.40	0.40	0.40	5.00	7.50	7.50	0.007	69,942
EQP2	§89-130≤kW<225 200(	0.20	0.20	0.20	3.50	4.00	4.00	0.007	1,025,820
EQP3	§89-225≤kW<450 200(	0.20	0.20	0.20	3.50	4.00	4.00	0.007	909,249
EQP4	T4-56≤kW<130 2015	0.02	0.02	0.02	5.00	0.40	0.19	0.007	99,085
EQP5	§89-75≤kW<130 2007	0.30	0.30	0.30	5.00	4.00	4.00	0.007	244,798
EQP6	T4-56≤kW<130 2015	0.02	0.02	0.02	5.00	0.40	0.19	0.007	93,256
EQP9	§89-75≤kW<130 2007	0.30	0.30	0.30	5.00	4.00	4.00	0.007	23,314
EQP10	§89-75≤kW<130 2007	0.30	0.30	0.30	5.00	4.00	4.00	0.007	122,399
EQP11	§89-75≤kW<130 2007	0.30	0.30	0.30	5.00	4.00	4.00	0.007	134,056
EQP12	T4-56≤kW<130 2015	0.02	0.02	0.02	5.00	0.40	0.19	0.007	134,056

Final emission factor options:

Category	EF Unit	Activity Unit	Emission Unit	Multiplier
EPA_NRS	g/kW-hr	kW-hr/yr	ton/yr	1.10E-6

Conversions

453.6	g/lb
1.341	hp/kW
2,000	lb/ton

Underground Mobile Equipment (Tailpipes) - continued

Emissions by Area			PM_TPY	PM10_PPD	PM10_TPY	PM2.5_PPD	PM2.5_TPY	CO_PPH	CO_TPY	NOX_PPH	NOX_TPY	SO2_PPH	SO2_TPY	VOC_TPY
	Equipment		PM	PM10		PM2.5		CO		NOX		SO2		VOC
ID	Type	% UG	ton/yr	lb/day	ton/yr	lb/day	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	ton/yr
EQP1	Drill	95%	2.9E-2	0.282	2.9E-2	0.282	2.9E-2	0.147	0.366	0.220	0.549	1.9E-4	4.8E-4	0.549
EQP2	Loader	95%	0.215	2.066	0.215	2.066	0.215	1.506	3.75981	1.722	4.297	2.8E-3	7.1E-3	4.297
EQP3	Haul Truck	71%	0.142	1.366	0.142	1.366	0.142	0.996	2.48555	1.138	2.841	1.9E-3	4.7E-3	2.841
EQP4	Support Truck	70%	1.5E-3	1.5E-2	1.5E-3	1.5E-2	1.5E-3	0.153	0.382	1.2E-2	3.1E-2	2.0E-4	5.0E-4	1.5E-2
EQP5	Forklift	70%	5.7E-2	0.545	5.7E-2	0.545	5.7E-2	0.378	0.944	0.303	0.756	5.0E-4	1.2E-3	0.756
EQP6	Grader	95%	2.0E-3	1.9E-2	2.0E-3	1.9E-2	2.0E-3	0.196	0.488	1.6E-2	3.9E-2	2.6E-4	6.4E-4	1.9E-2
EQP9	Support Truck	95%	7.3E-3	7.0E-2	7.3E-3	7.0E-2	7.3E-3	4.9E-2	0.122	3.9E-2	9.8E-2	6.4E-5	1.6E-4	9.8E-2
EQP10	Support Truck	85%	3.4E-2	0.331	3.4E-2	0.331	3.4E-2	0.230	0.574	0.184	0.459	3.0E-4	7.5E-4	0.459
EQP11	Support Truck	95%	4.2E-2	0.405	4.2E-2	0.405	4.2E-2	0.281	0.702	0.225	0.562	3.7E-4	9.2E-4	0.562
EQP12	Support Truck	95%	2.8E-3	2.7E-2	2.8E-3	2.7E-2	2.8E-3	0.281	0.702	2.2E-2	5.6E-2	3.7E-4	9.2E-4	2.7E-2
Total			0.53	5.12	0.53	5.12	0.53	4.22	10.53	3.88	9.69	6.9E-3	1.7E-2	9.62

NO2 / NOX In-Stack Ratio (ISR): 0.11 (CAPCOA 2011)

Conversions
2,000 lb/ton

Underground Mobile Equipment (Tailpipes) - continued

Source Parameters [1]

		TYPE	UTM_E	UTM_N	ELEV_M	FLOW_MPS	DIA_M	TEMP_K	RELHT_M
		Source	UTM NAD 83		Elev.	Flow	Dia.	Temp	Ht
Model ID	Activity	Type	E m	N m	m	mps	m	K	m
UG	*Underground*	POINT	471034	4835236	1209	20.9763	3.6576	298.15	3

[1] *UTM, Elev. - (Wolverson 2019.03.17); Stack Params: (Auscenco 2021) pages 254-255*

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: M. Mavko
	PROJECT NO: 343-1	PAGE: 1 OF: 7 SHEET: Tanks
AIR EMISSION CALCULATIONS	SUBJECT: Tank Emission Calculations	DATE: July 18, 2022

Fuel Storage Tanks

TEU	Storage Tank	Capacity gal	Dimensions Diameter ft	Dimensions Length ft	Throughput gal/yr	Configuration	VOC Emissions* lb/yr	VOC Emissions* ton/yr	Reference
TG1	Mine Site Gasoline Tank #1	10,000	9.5	19	120,000	Horizontal	1852.3	0.93	*Based on 1 turnover/month*
TD1	Mine Site Diesel Tank #1	30,000	18	18	240,000	Vertical	8.18	0.0041	*(Dyer 2019.03.21)*
TD2	Mine Site Diesel Tank #2	3,000	7	14	15,000	Horizontal	0.86	4.3E-4	*(Dyer 2019.03.21)*

**Emissions calculated using EPA Tanks 4.0.9d (EPA 1999a)*

HAP/TAP Emission Factors and Emissions

Operation Schedule 365 day/yr

Gasoline

CAS No.	Pollutant	EPA[1] Conc. wt. %	SCAQMD[2] Conc. wt. %	Final EF Max wt. %	TG1 Emissions lb/day	TG1 Emissions ton/yr
71-43-2	Benzene	1.608%	1.800%	1.800%	0.09	0.017
92-52-4	Biphenyl	0.010%		0.010%	5.07E-04	9.26E-05
110-82-7	Cyclohexane	0.240%	0.240%	0.240%	0.01	0.002
100-41-4	Ethyl benzene	1.605%	1.400%	1.605%	0.08	0.015
110-54-3	Hexane	7.138%	1.000%	7.138%	0.36	0.066
91-20-3	Naphthalene	0.444%		0.444%	0.02	0.004
108-95-2	Phenol	0.055%		0.055%	0.00	0.001
108-88-3	Toluene	7.212%	7.000%	7.212%	0.37	0.067
95-63-6	1,2,4-Trimethylben	2.500%	2.500%	2.500%	0.13	0.023
1330-20-7	Xylene (mixture), i	7.170%	7.000%	7.170%	0.36	0.066
98-82-8	Isopropylbenzene (Cumene)	0.500%	0.500%	0.500%	0.03	0.005
Total					1.46	0.266

Diesel

CAS No.	Pollutant	EPA[1] Conc. wt. %	SCAQMD[2] Max wt. %	CATEF[3] Conc. wt. %	Final EF Max wt. %	TD1 Emissions lb/day	TD1 Emissions ton/yr	TD2 Emissions lb/day	TD2 Emissions ton/yr	Total ton/yr
71-43-2	Benzene	0.001%		0.0001%	0.001%	1.88E-7	3.44E-8	1.98E-8	3.61E-9	3.80E-8
92-52-4	Biphenyl	0.100%			0.100%	2.24E-5	4.09E-6	2.36E-6	4.30E-7	4.52E-6
100-41-4	Ethyl benzene	0.013%	0.010%		0.013%	2.91E-6	5.32E-7	3.06E-7	5.59E-8	5.88E-7
110-54-3	Hexane	1.000%			1.000%	2.24E-4	4.09E-5	2.36E-5	4.30E-6	4.52E-5
91-20-3	Naphthalene	0.550%			0.550%	1.23E-4	2.25E-5	1.30E-5	2.37E-6	2.49E-5
85-01-8	Phenanthrene	0.125%			0.125%	2.80E-5	5.11E-6	2.95E-6	5.38E-7	5.65E-6
108-95-2	Phenol	0.064%			0.064%	1.43E-5	2.62E-6	1.51E-6	2.75E-7	2.89E-6
100-42-5	Styrene	0.032%			0.032%	7.17E-6	1.31E-6	7.54E-7	1.38E-7	1.45E-6
108-88-3	Toluene	0.032%	0.030%	0.00004%	0.032%	7.17E-6	1.31E-6	7.54E-7	1.38E-7	1.45E-6
95-63-6	1,2,4-Trimethylben	1.000%	1.000%		1.000%	2.24E-4	4.09E-5	2.36E-5	4.30E-6	4.52E-5
1330-20-7	Xylene (mixture), i	0.290%	0.290%	0.0003%	0.290%	6.50E-5	1.19E-5	6.83E-6	1.25E-6	1.31E-5
7440-38-2	Arsenic and compc	not volatile			0%	0.0	0.0	0.0	0.0	0.0
7440-41-7	Beryllium and com	not volatile			0%	0.0	0.0	0.0	0.0	0.0
7440-43-9	Cadmium and com	not volatile			0%	0.0	0.0	0.0	0.0	0.0
18540-29-	Chromium VI, chrc	not volatile			0%	0.0	0.0	0.0	0.0	0.0
7440-50-8	Copper and compc	not volatile			0%	0.0	0.0	0.0	0.0	0.0
7439-96-5	Manganese and co	not volatile			0%	0.0	0.0	0.0	0.0	0.0
7439-97-6	Mercury and comp	0.00004%			0.00004%	8.96E-9	1.64E-9	9.42E-10	1.72E-10	1.81E-9
C365	Nickel compounds	not volatile			0%	0.0	0.0	0.0	0.0	0.0
Total						7.19E-4	1.31E-4	7.56E-5	1.38E-5	1.45E-4

[1] *(EPA 1999a)*
[2] *(AQMD 2020)*
[3] *(CARB 2000)*

Conversion
1E-07 %/ppb
2,000 lb/ton

Mine Site Gasoline Tank #1

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification:	TG1
City:	Malheur County
State:	Oregon
Company:	Calico Resources, Inc.
Type of Tank:	Horizontal Tank
Description:	Mine Site Gasoline Tank #1

Tank Dimensions

Shell Length (ft):	19.00
Diameter (ft):	9.50
Volume (gallons):	10,000.00
Turnovers:	12.00
Net Throughput(gal/yr):	120,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meteorologicalx Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TG1 - Horizontal Tank
Malheur County, Oregon

		Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Mixture/Component	Month	Avg.	Min.	Max.		Avg.	Min.	Max.					
Gasoline (RVP 9)	All	52.81	46.88	58.74	50.94	3.9950	3.5384	4.4980	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

Mine Site Gasoline Tank #1 - continued

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

TG1 - Horizontal Tank
Malheur County, Oregon

Annual Emission Calculations	
Standing Losses (lb):	1,087.5463
Vapor Space Volume (cu ft):	857.8099
Vapor Density (lb/cu ft):	0.0487
Vapor Space Expansion Factor:	0.1431
Vented Vapor Saturation Factor:	0.4986
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	857.8099
Tank Diameter (ft):	9.5000
Effective Diameter (ft):	15.1637
Vapor Space Outage (ft):	4.7500
Tank Shell Length (ft):	19.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0487
Vapor Molecular Weight (lb/lb-mole):	67.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.9950
Daily Avg. Liquid Surface Temp. (deg. R):	512.4830
Daily Average Ambient Temp. (deg. F):	50.9208
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	510.6108
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,400.5355
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.1431
Daily Vapor Temperature Range (deg. R):	23.7125
Daily Vapor Pressure Range (psia):	0.9596
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.9950
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	3.5384
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	4.4980
Daily Avg. Liquid Surface Temp. (deg R):	512.4830
Daily Min. Liquid Surface Temp. (deg R):	506.5548
Daily Max. Liquid Surface Temp. (deg R):	518.4111
Daily Ambient Temp. Range (deg. R):	23.6750
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.4986
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	3.9950
Vapor Space Outage (ft):	4.7500
Working Losses (lb):	764.7587
Vapor Molecular Weight (lb/lb-mole):	67.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.9950
Annual Net Throughput (gal/yr.):	120,000.0000
Annual Turnovers:	12.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	9.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	1,852.3049

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

TG1 - Horizontal Tank
Malheur County, Oregon

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 9)	764.76	1,087.55	1,852.30

Mine Site Diesel Tank #1

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification		
User Identification:	TD1	
City:	Malheur County	
State:	Oregon	
Company:	Calico Resources, Inc.	
Type of Tank:	Vertical Fixed Roof Tank	
Description:	Mine Site Diesel Tank #1	
Tank Dimensions		
Shell Height (ft):		18.00
Diameter (ft):		18.00
Liquid Height (ft) :		15.76
Avg. Liquid Height (ft):		9.00
Volume (gallons):		30,000.00
Turnovers:		8.00
Net Throughput(gal/yr):		240,000.00
Is Tank Heated (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	White/White	
Shell Condition	Good	
Roof Color/Shade:	White/White	
Roof Condition:	Good	
Roof Characteristics		
Type:	Dome	
Height (ft)		1.00
Radius (ft) (Dome Roof)		18.00
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TD1 - Vertical Fixed Roof Tank
Malheur County, Oregon

		Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol.	Liquid Mass	Vapor Mass	Mol.	Basis for Vapor Pressure
Mixture/Component	Month	Avg.	Min.	Max.		Avg.	Min.	Max.	Weight.	Fract.	Fract.	Weight	Calculations
Distillate fuel oil no. 2	All	52.81	46.88	58.74	50.94	0.0051	0.0041	0.0062	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065

Mine Site Diesel Tank #1 - continued

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

TD1 - Vertical Fixed Roof Tank
Malheur County, Oregon

Annual Emission Calculations

Standing Losses (lb):	4.4158
Vapor Space Volume (cu ft):	2,417.9791
Vapor Density (lb/cu ft):	0.0001
Vapor Space Expansion Factor:	0.0419
Vented Vapor Saturation Factor:	0.9975
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	2,417.9791
Tank Diameter (ft):	18.0000
Vapor Space Outage (ft):	9.5021
Tank Shell Height (ft):	18.0000
Average Liquid Height (ft):	9.0000
Roof Outage (ft):	0.5021
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.5021
Dome Radius (ft):	18.0000
Shell Radius (ft):	9.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0051
Daily Avg. Liquid Surface Temp. (deg. R):	512.4830
Daily Average Ambient Temp. (deg. F):	50.9208
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	510.6108
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,400.5355
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0419
Daily Vapor Temperature Range (deg. R):	23.7125
Daily Vapor Pressure Range (psia):	0.0022
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0051
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0041
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0062
Daily Avg. Liquid Surface Temp. (deg R):	512.4830
Daily Min. Liquid Surface Temp. (deg R):	506.5548
Daily Max. Liquid Surface Temp. (deg R):	518.4111
Daily Ambient Temp. Range (deg. R):	23.6750
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9975
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0051
Vapor Space Outage (ft):	9.5021
Working Losses (lb):	3.7608
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0051
Annual Net Throughput (gal/yr.):	240,000.0000
Annual Turnovers:	8.0000
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	30,000.0000
Maximum Liquid Height (ft):	15.7599
Tank Diameter (ft):	18.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	8.1766

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual
TD1 - Vertical Fixed Roof Tank
Malheur County, Oregon

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	3.76	4.42	8.18

Mine Site Diesel Tank #2

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification:	TD2
City:	Malheur County
State:	Oregon
Company:	Calico Resources, Inc.
Type of Tank:	Horizontal Tank
Description:	Mine Site Diesel Tank #2

Tank Dimensions

Shell Length (ft):	14.00
Diameter (ft):	7.00
Volume (gallons):	3,000.00
Turnovers:	5.00
Net Throughput(gal/yr):	15,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TD2 - Horizontal Tank
Malheur County, Oregon

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	52.81	46.88	58.74	50.94	0.0051	0.0041	0.0062	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065

Mine Site Diesel Tank #2 - continued

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

TD2 - Horizontal Tank
Malheur County, Oregon

Annual Emission Calcaulations

Standing Losses (lb):	0.6277
Vapor Space Volume (cu ft):	343.1740
Vapor Density (lb/cu ft):	0.0001
Vapor Space Expansion Factor:	0.0419
Vented Vapor Saturation Factor:	0.9991
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	343.1740
Tank Diameter (ft):	7.0000
Effective Diameter (ft):	11.1732
Vapor Space Outage (ft):	3.5000
Tank Shell Length (ft):	14.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0051
Daily Avg. Liquid Surface Temp. (deg. R):	512.4830
Daily Average Ambient Temp. (deg. F):	50.9208
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	510.6108
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,400.5355
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0419
Daily Vapor Temperature Range (deg. R):	23.7125
Daily Vapor Pressure Range (psia):	0.0022
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0051
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0041
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0062
Daily Avg. Liquid Surface Temp. (deg R):	512.4830
Daily Min. Liquid Surface Temp. (deg R):	506.5548
Daily Max. Liquid Surface Temp. (deg R):	518.4111
Daily Ambient Temp. Range (deg. R):	23.6750
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9991
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0051
Vapor Space Outage (ft):	3.5000
Working Losses (lb):	0.2350
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0051
Annual Net Throughput (gal/yr.):	15,000.0000
Annual Turnovers:	5.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	7.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.8628

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

TD2 - Horizontal Tank
Malheur County, Oregon

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.24	0.63	0.86

Air Sciences Inc.	PROJECT TITLE: Grassy Mountain Mine	BY: M. Mavko
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AIR EMISSION CALCULATIONS	SUBJECT: Conversions and Constants	DATE: July 18, 2022

Conversions

60	sec/min
60	min/hr
24	hr/day
365	day/yr
8,760	hr/yr
3,600	s/hr
2,000	lb/ton
453.593	g/lb
3.28084	ft/m
35.3147	ft^3/m^3
7,000	gr/lb
1.341	hp/kW
907.1858	kg/ton
459.67	°R at 0°F
68	°F, standard
7,000	Btu/hp-hr
7.05	lb/gal distillate oil
137,000	Btu/gal
2.2369	mi/hr per m/s
7.48052	gal/ft^3
1.10231	ton/t
2.20462	lb/kg
1,609.3	m/mi
4,046.9	m^2/acre
43,560	ft^2/acre
12	in/ft
1.102	ton/mt
1.0E+6	g/mt
3	ft/yd
1.0E+6	scf/MMscf
10,000	m^2/ha
1,000	kg/mt
273.15	K at 0°C
32	°F at 0°C
1.8	°F/°C
1,000	ng/µg
0.293297	MW-hr/MMBtu
12	mo/yr
5,280	ft/mi
29.9213	inHg/atm

Fuel Specifications

15	ppm S content	*40 CFR 80.510 (Non-road diesel)*
7.05	lb/gal distillate oi	*(EPA 1994), App. A*
32.065	lb/lb-mol S, and	
64.06	lb/lb-mol SO2	
7,000	Btu/hp-hr	*(EPA 1995), Sec. 3.3, (Diesel engine)*
0.00939	MMBtu/kW-hr	Diesel
0.137	MMBtu/gal diesel	*(EPA 1995), App. A (Diesel)*
0.0915	MMBtu/gal Propane	
3.78541	liter/gal	

Bulk Material

2,750	kg/m^3, Limestone	*https://www.engineeringtoolbox.com/soil-rock-bulking-factor-d_1557.html*
4,635	lb/yd^3	
4,024	lb/yd^3, concrete	*(EPA 1995)AP-42 p. 11-12.9, 6/06*

(EPA 1995), Sec. 3.3, (Diesel)

(EPA 1995), Appendix A 'Weights of Selected Substances' (Distillate oil)

(EPA 1995), App. A (Diesel)

14.5833	troy oz/lb			
1	(g/s)/(g/s)			
0.126	(g/s)/(lb/hr)			
0.00525	(g/s)/(lb/day)			
0.02877	(g/s)/(ton/yr)			
1	g/dscm	=	0.437 grain/dscf	*http://www.unitconversion.org/unit_converter/density.html*
52	week/yr			

Constants

M.W. SO2	64.0638
M.W. S	32.065
M.W. O	15.9994

Diesel SO2

15	parts S	7.05	lb	64.06	SO2		gal	0.00939	MMBtu	453.593	g	=	6.57E-03 g SO2
1.0E+06			gal diesel	32.065	S	0.137	MMBtu		kW-hr		lb		kW-hr

Propane SO2

185	lb S	44.08	lb C3H8		lb mol	7,000	gr	100	SCF	=	15.90	gr S
1.00E+06	lb C3H8		lb mol	359.05	SCF (0C)		lb		100SCF				100 SCF

Propane heating value 91,500 *Btu/gal* *(EPA 1995), Table 1.5-1 (07/08) Footnote a*

AP-42, Chapter 13.2.4 Particle Size Fractions

0.35	PM10
0.053	PM2.5

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Fuel Combustion Exhaust Flow (EPA Method 19, F-factor)

Propane Heater

F-factor	8,710	dscf/MMBtu	Propane, dry		
O2%dry	3	%		9	%
Heat input	1	MMBtu/hr			
Standard exhaust flow	10,170	dscf/hr		15,297	dscf/hr
	169	dscfm		255	dscfm
Vol % moisture	15.0%	standard for propane boilers			
Temperature	360	°F, Engineering Toolbox* (LPG heating appliances)			
Pressure, site	0.87	atm			
Actual exhaust flow	356	acfm (wet)/MMBtu		536	acfm (wet)/MMBtu

Diesel Engine

F-factor	9,190	dscf/MMBtu	Oil, dry		
O2%dry	9	%			
Heat input	0.007	MMBtu/hp-hr	*(EPA 1995), Sec. 3.3, (Diesel engine)*		
Standard exhaust flow	113	dscf/hp-hr			
	1.9	dscfm/hp		2.5	dscfm/kW
Vol % moisture	8.0%	standard for diesel engines			
Temperature	1,100	°F, Engineering Toolbox* (diesel exhaust)			
Pressure, site	0.87	atm			
Actual exhaust flow	7.0	acfm (wet)/hp		9.3	acfm (wet)/kW

* *http://www.engineeringtoolbox.com/fuels-exhaust-temperatures-d_168.html*

Refinery Exhaust Flow

dscfm acfm temp_F dia_ft

Source	Design Rate	Water	Exhaust Parameters Flow dscfm	Flow acfm	Temp F	Velocity ft/s	Dia ft	BH PM gr/dscf
Carbon Regeneration Kiln (Drum)	0.2 ton/hr	1%	80	110	150	10	0.48	
Electrowinning Cells & Pregnant Solution Tank		4%	2,660	3,380	100	161	0.67	
Mercury Retort		1%	16	20	150	5	0.29	
Melting Furnace	0.60 MMBtu/hr	1%	3,500	4,700	150	100	1	0.022
	7.5 hr/day							
	82.9 liter/day, Diesel							
	2 day/week							

(NDEP 2017.07), Exhaust Parameters

(Ausenco 2021.11.15), Furnace Design Rate Multipied by 1.5-2x for design and operational flexibility

Site Pressure Calculation

http://www.sensorsone.com/altitude-pressure-units-conversion/

~ Site Elev. (m)	~ Site Elev. (ft)
1,160	3,805.8

Elev(ft)	Pres(inHg)
3,000	26.817
4,000	25.842

Site (ft)	Site (inHg)	Site(atm)
3,805.8	26.03137	0.86999

AIR SCIENCES INC.

DENVER • PORTLAND • LOS ANGELES

Grassy Mountain Mine New Source Review Analysis Modeling Report

PREPARED FOR:
CALICO RESOURCES USA CORP.

PROJECT NO. 343-1
AUGUST 1, 2022

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Appendices

Appendix A – BPIPPRM Building Parameters

1.0 INTRODUCTION

Calico Resources USA Corp. (Calico) proposes constructing and operating the Grassy Mountain Mine project in Malheur County, Oregon. The project is a proposed underground gold and silver mine with on-site milling and refining operations. This New Source Review (NSR) modeling report presents an air quality analysis to support Calico's application to obtain the appropriate air discharge permits for the Grassy Mountain project.

1.1 Regulatory Considerations

The Grassy Mountain location is designated as unclassified for all criteria pollutants (EM Strategies 2018), and therefore it is subject to attainment area rules. The project facility-wide potential emissions in tons per year (ton/yr) are provided in Table 1. This table also provides the applicable Significant Emission Rate (SER) in ton/yr from Oregon Administrative Rule (OAR) Chapter 340, Division 200, Section 0020, Subsection 161 (OAR 340-200-0020(161)) for each regulated pollutant. Detailed criteria pollutant emission calculations are provided in Appendix A of the NSR Model Protocol (Air Sciences, 2022).

Table 1. Grassy Mountain Potential Emissions (ton/yr)

Source Category	PM	PM_{10}	$PM_{2.5}$	CO	NO_X	SO_2	VOC	Pb	$PM_{2.5}$ Precursor	O_3 Precursor
Process	10.47	4.68	1.47	7.97	5.89	0.66	1.57	1.6E-4	5.89	5.89
Mining and Fugitive	38.48	10.78	1.08	10.89	1.69	0.001	--	1.3E-5	1.69	1.69
Nonroad	0.53	0.53	0.53	10.53	9.69	0.02	9.62	6.8E-4	9.69	9.69
Facility Total	**49.48**	**15.99**	3.08	29.39	17.27	0.67	11.19	8.5E-4	17.27	17.27
SER	**25**	**15**	**10**	**100**	**40**	**40**	**40**	**0.6**	**40**	**40**

Particulate matter (PM); PM less than 10/2.5 microns (PM_{10}/$PM_{2.5}$); carbon monoxide (CO); nitrogen oxides (NO_X); sulfur dioxide (SO_2); volatile organic compounds (VOC); lead (Pb)
$PM_{2.5}$ precursor represents the higher of NO_X and SO_2 emissions; ozone (O_3) precursor represents the higher of NO_X and VOC emissions.

As shown in Table 1, the facility-wide potential emissions exceed the SER for PM and PM_{10} (bold values under Facility Total). Therefore, the project is designated as a state major source for these pollutants and is required to obtain a Standard Air Contaminant Discharge Permit (ACDP) per OAR 340-216-8010, Part C.

This table also shows that the facility-wide potential emissions are less than the applicable Title V (100 ton/yr per pollutant) and Prevention of Significant Deterioration (PSD) Major Source (250 ton/yr per pollutant) thresholds. Therefore, the Grassy Mountain facility is designated as a minor source for Title V and PSD determinations.

Based on the Grassy Mountain location, source classification, and potential emissions, it is subject to the Type B State NSR per OAR 340-224-0010(2)(b) for PM_{10}.

1.2 Project Description

The Project will consist of an underground gold and silver ore mine using the Drift and Fill mining method, and a process facility to mill, refine, and melt gold and silver ore into doré bars for further processing off-site.

The underground mine will be developed using drill and blast techniques. A main ramp will be established from the portal to the bottom level. A level access will be mined from the main ramp to the production area. As ore is removed from the production area, cemented rockfill (CRF) or rockfill will be placed to fill the production drifts eliminating voids in the production area. The rock used in the CRF or rockfill will come from a nearby borrow pit or the waste rock storage facility. The CRF will require a backfill batch plant at the surface. A mobile crushing unit located in the borrow pit will crush borrow pit material. The crushed rock from the borrow pit will be hauled to the backfill batch plant and used for CRF or hauled directly underground for rockfill. Material from the waste rock storage facility may also be hauled to the backfill batch plant to be used as CRF or hauled directly underground to be used as rockfill.

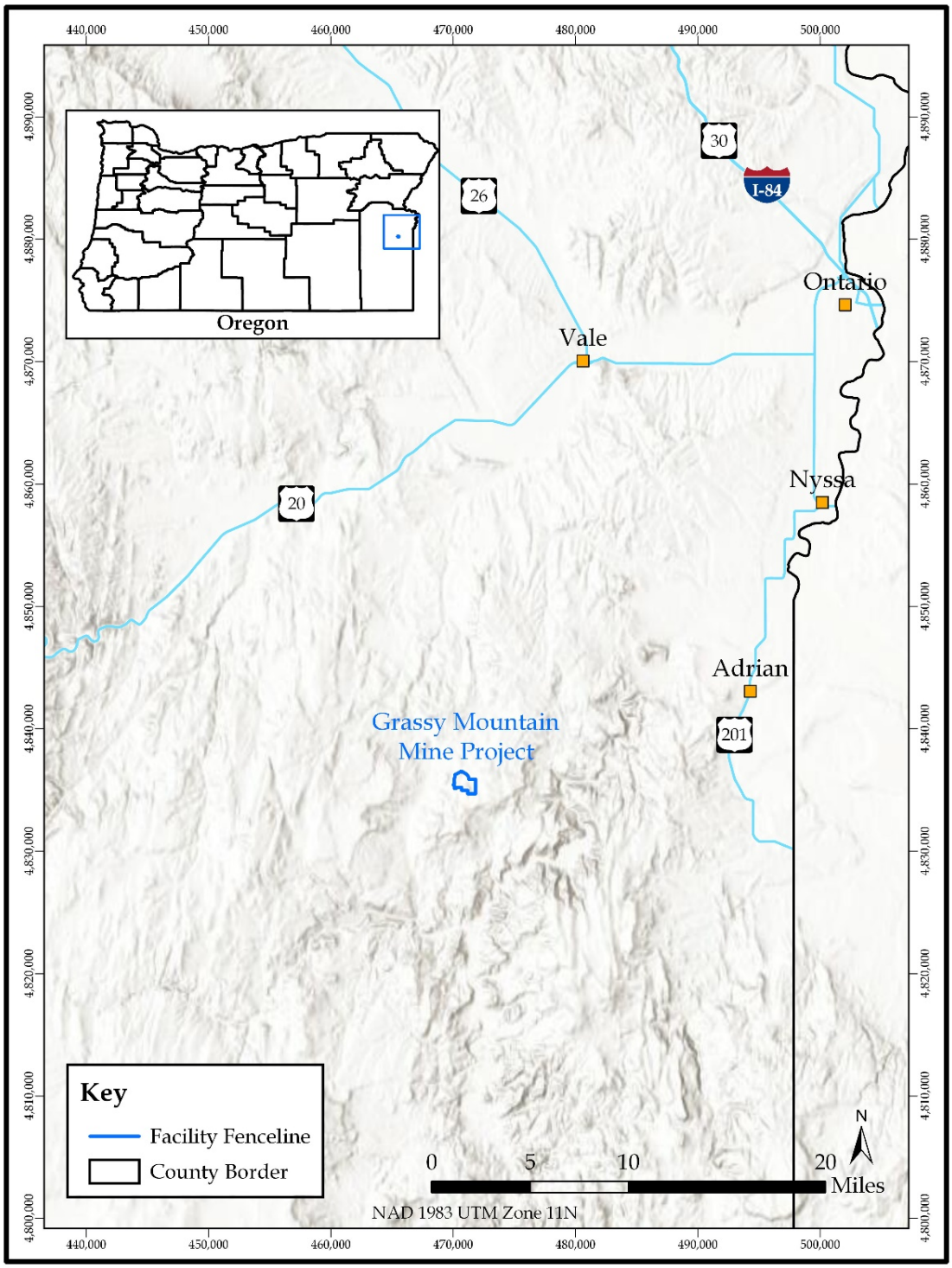
Economic material from the underground mine will be hauled using underground trucks from the production area to a stockpile on surface. A front-end loader will take the material from the stockpile to a mobile crushing unit that will include a jaw crusher as the primary stage, a screen and a secondary cone crusher for further size reduction. Crushed ore is then conveyed to a fine-ore bin, which is then transferred to the mill via a feed conveyor; from here, the process is a wet process. The crushed ore will be ground by a ball mill in closed circuit with a hydro-cyclone cluster. The hydro-cyclone overflow will flow to a leach/ carbon-in-leach (CIL) circuit via a pre-aeration tank. Lime is added during pre-aeration to control pH, and cyanide is added to the first leach tank. The leach/CIL circuit consists of a pre-aeration tank, 2 leach tanks and a series of 7 CIL tanks.

Leached gold and silver will be adsorbed onto activated granular carbon, which is present in all CIL tanks. Slurry advances through each of the 7 CIL tanks. Barren carbon is added to the last tank and flows through the circuit in the opposite direction to the slurry: loaded carbon extracted for the elution process is removed from CIL tank 1. The elution process strips gold and silver from the carbon into solution. Pregnant solution (solution loaded with gold and silver) is transferred to the gold room, and stripped carbon is regenerated in the propane-fired carbon regeneration kiln before being recycled to the CIL circuit. Some carbon loss occurs during heating in the kiln, and new carbon is added along with regenerated carbon to CIL tank 7.

The gold room will house the electrowinning cells, retort, barring furnace, and associated support equipment. In the electrowinning cells, gold and silver are plated onto cathodes using electrolysis. Periodically, the electrowinning cells will be opened, and the sludge cleaned out manually with a high-pressure spray gun. Sludge from the cells will flow by gravity to the electrowinning-sludge-filter feed tank and pumped through a filter press to be dewatered. Dewatered sludge is to be collected in trays and placed in the mercury retort to dry the sludge and remove mercury. Dried sludge will be removed from the retort and combined with fluxes in a flux mixer before being charged into the melting furnace, where the sludge will be melted and poured into doré bars.

The CIL tailings will be pumped to an agitated cyanide detoxification tank, where lime will be added to buffer pH, copper sulfate will be added as a reaction catalyst, and sodium metabisulfite will be added. Detoxified slurry will overflow from the detoxification tank to the tailings pump box where it will be pumped to the tailings management facility by the tailings pumps.

Figure 1. Facility Location Map



1.3 Site Characteristics

The Grassy Mountain deposit is situated near the western edge of the Snake River Plain in the semi-arid high desert plateau region in eastern Oregon. The average annual precipitation in the area is approximately 229 millimeters. The terrain is mainly an open steppe with mesas, broad valleys, and gently rolling hills leading to steeper uplands. Elevations range from 1,006 to 1,311 meters above mean sea level. Vegetation consists of sagebrush, weeds, and desert grasses tolerant of semi-arid conditions (Ausenco 2020).

Figure 2 shows the modeled mine source locations. Figure 3 shows the modeled refinery locations. Figure 4 shows a view of the buildings included in downwash calculations.

Figure 2. Model Source Locations for Grassy Mountain Mine Facility

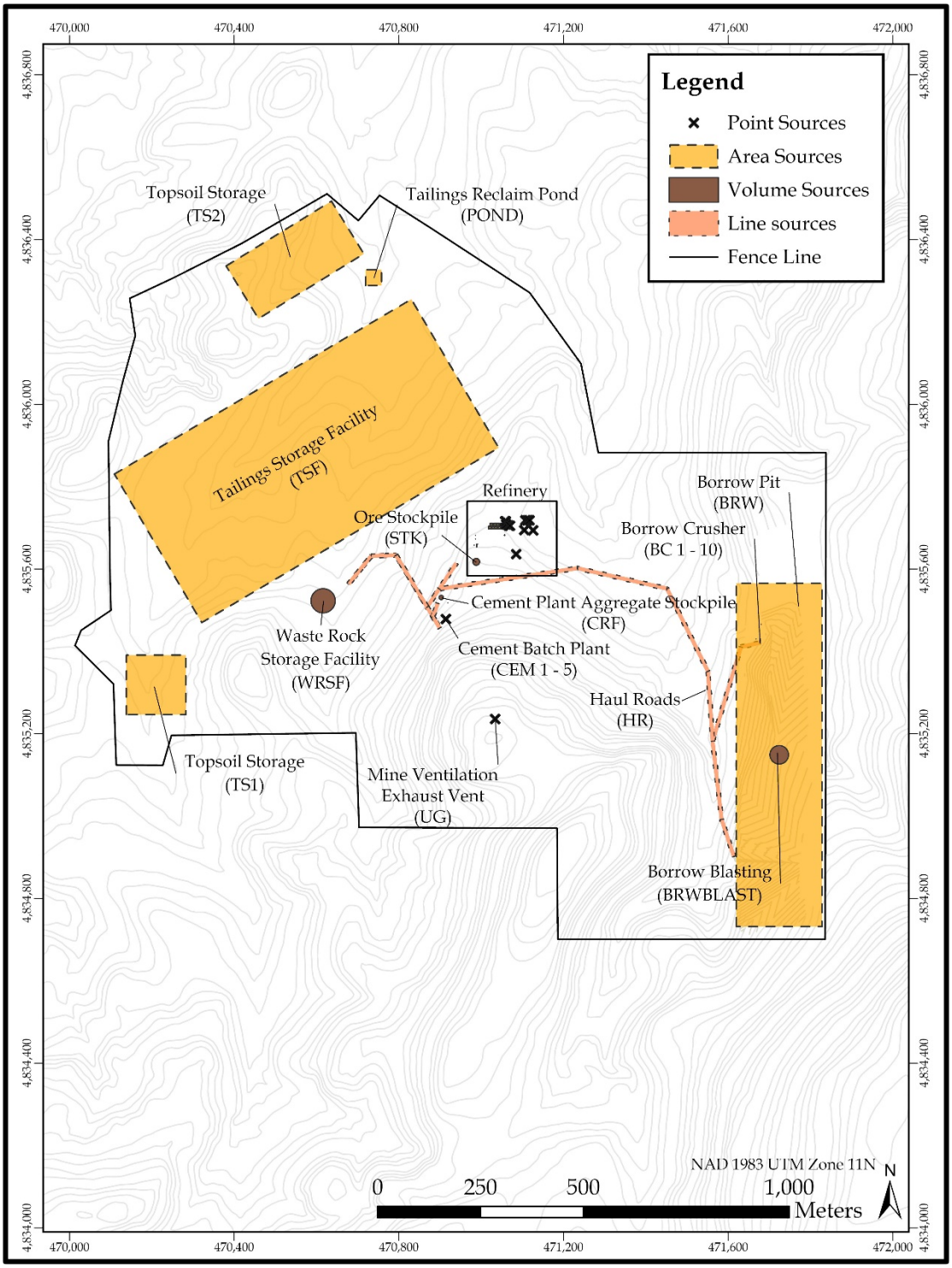


Figure 3. Model Source Locations for Grassy Mountain Mine Refinery

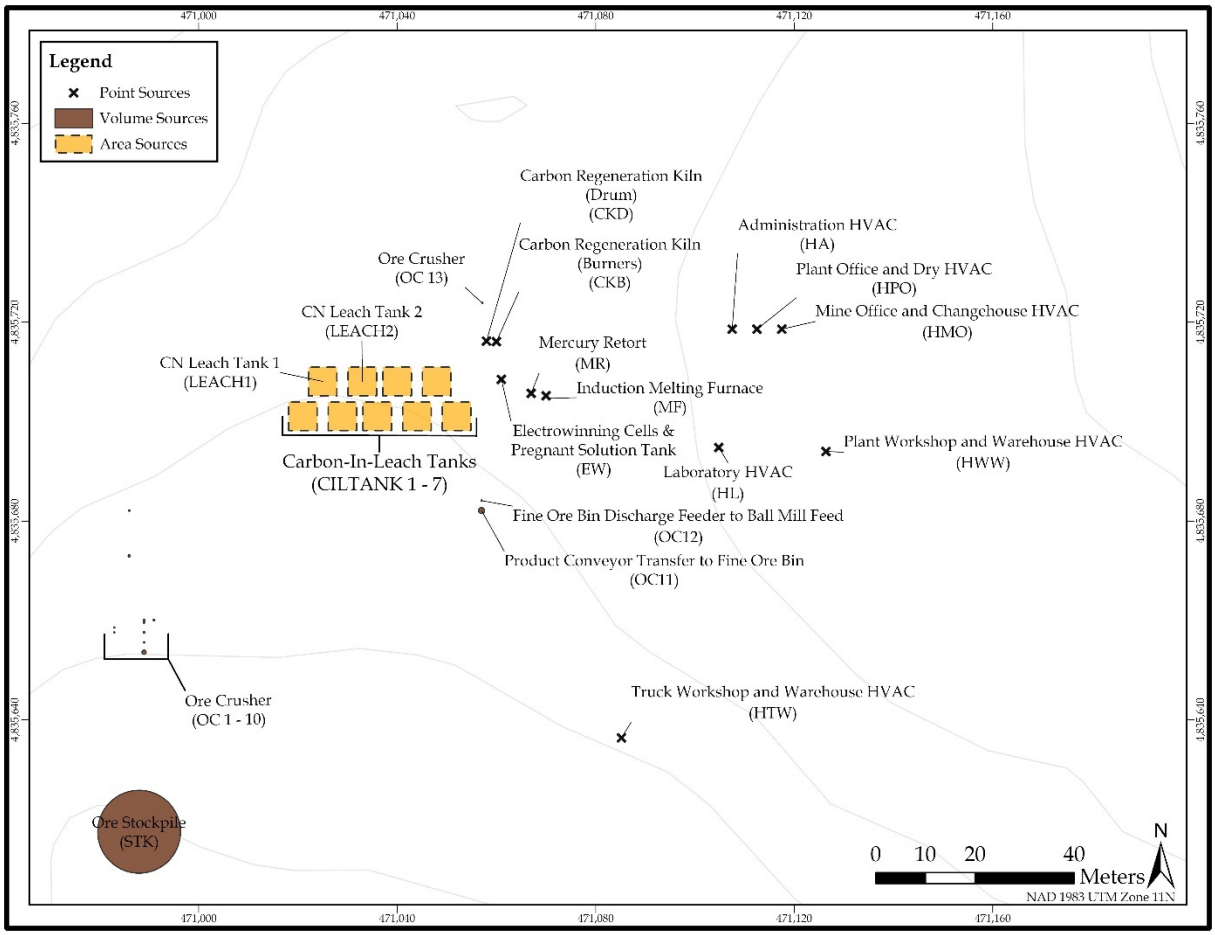
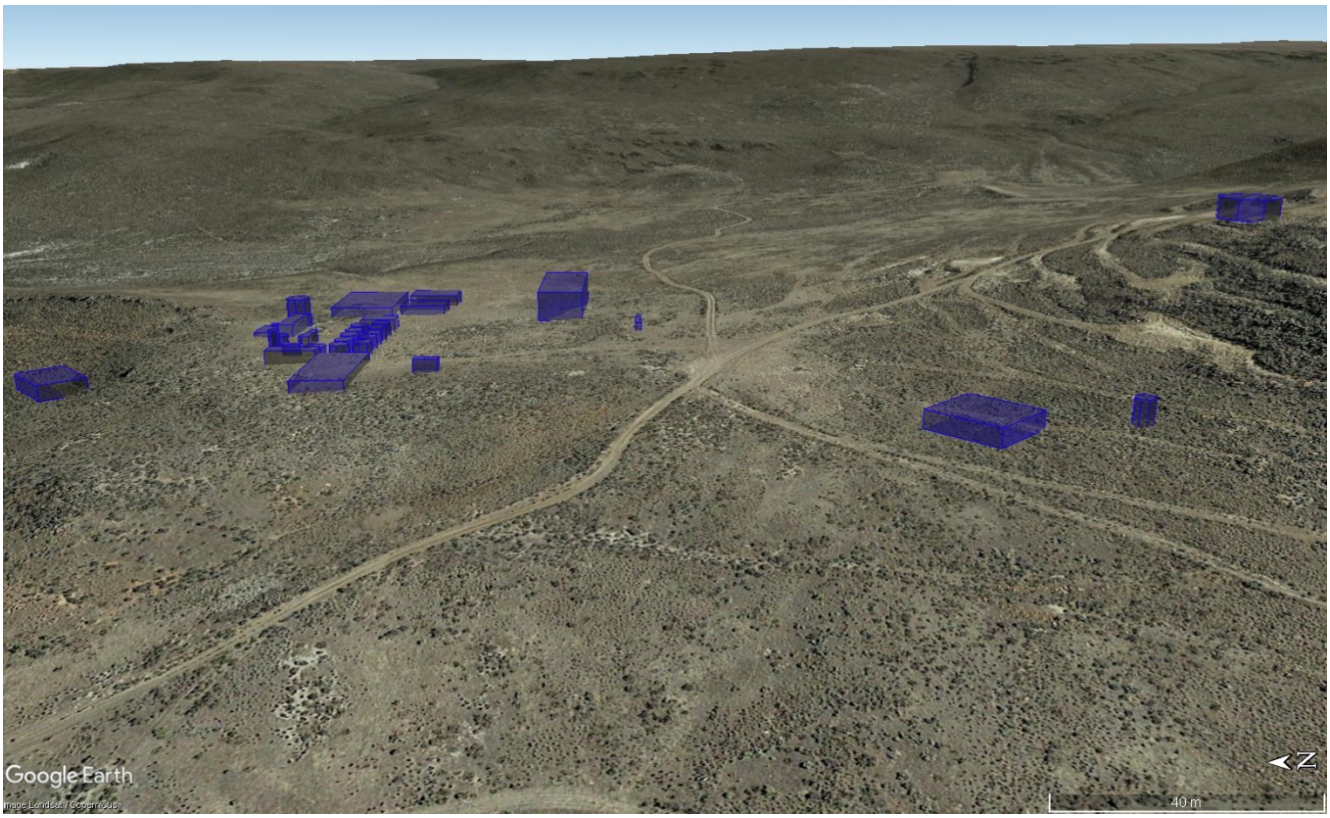


Figure 4. Perspective View of Refinery Area Model Buildings Included for Downwash



2.0 NSR MODELING METHODS

2.1 Model Selection

The analysis was conducted using version 22112 of the AERMOD modeling system. The AERMOD modeling system is the recommended model for short-range analyses (up to 50 kilometers) in the Guideline on Air Quality Models, which is maintained by the United States Environmental Protection Agency (EPA) and published as Appendix W to the Code of Federal Regulations, Title 40, Part 51.

Regulatory default options in AERMOD were used to estimate the ground-level concentrations for the PM_{10}, $PM_{2.5}$, and NO_2. Electronic copies of the AERMOD input, output, and other associated files are provided on digital media in .

2.2 Modeled Sources

This analysis includes evaluation of potential emissions from all sources identified in the ACDP application at the facility. Emission sources include exhaust stacks (generators, silo vents, heaters, and process sources) as well as fugitive emission sources (blasting, hauling, material handling, crushing, and conveying). Haul road fugitive dust was also included as a source for NSR modeling.

A complete list of modeled sources and descriptions is provided in Appendix A of the NSR Model Protocol (Air Sciences, 2022).

2.3 Source Characterization and Model Input Parameters

The model input parameters for each source are presented in Appendix A of the NSR Model Protocol (Air Sciences, 2022). A facility plot plan showing the project boundary and layout of sources is provided in Figure 2; a closer view of the refinery is shown in Figure 3. For references and additional details regarding source characterization, see Appendix A of the NSR Model Protocol (Air Sciences, 2022), Emissions Inventory Worksheets.

2.3.1 Volume and Point Sources

All the sources with stacks included in this report are characterized as POINT sources in the model. An exhaust temperature of 0˚K is used for sources not associated with heated processes (e.g., silo vents). AERMOD replaces a 0˚K exhaust temperature with the hourly ambient temperature provided in the meteorological data for dispersion calculations.

All process fugitive sources without a stack (e.g., crushing) are characterized as VOLUME sources. The initial lateral and vertical dispersion parameters are calculated based on approximate source dimensions and coefficients provided in EPA guidance.[1]

2.3.2 Underground Mining Sources

Emissions from underground mining activities include fugitive dust from drilling, blasting, and materials handling; and tailpipe emissions from nonroad mobile equipment. Tailpipe emissions from nonroad engines are included in the analysis at the request of the Oregon Department of Environmental Quality (DEQ). The inclusion of these emissions results in a highly conservative analysis because, 1) nonroad engines are excluded from the definition of "stationary sources"[2] and 2) states are preempted from enforcing emission control standards for nonroad engines.[3]

The Mine Safety and Health Administration (MSHA)-compliant ventilation system continuously draws fresh air into the mine and exhausts "stale" air from a single vent at the surface. This vent is characterized as a single POINT source using stack parameters consistent with the ventilation system design.

2.3.3 Haul Road Source Characterization

Aboveground roadway emissions from on-site hauling and water truck activity are characterized as LINE sources. The LINE source in AERMOD is a type of AREA source. The LINE source release heights are based on the mobile equipment heights, and the source widths are based on planned road widths, consistent with the recommendations for AREA sources described by EPA's Haul Road Workgroup[4]. The Haul Road Workgroup generally recommends the use of adjacent VOLUME sources for haul road emissions. For this project, however, the haul roads are sufficiently distant from the facility boundary such that the characterization is not expected to make a substantial difference in impacts, and the use of LINE sources instead of adjacent VOLUME sources reduces the total number of sources and model run times. Haul roads modeled in complex terrain as LINE or AREA sources typically result in higher modeled impacts compared to the same roads modeled as VOLUME sources, so the characterization should be considered conservative.

2.3.4 Area Sources

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[1] EPA. 2016. User's Guide for the AMS/EPA Regulatory Model (AERMOD). EPA-454/B-16-011. December 2016.

[2] 42 U.S.C. §7602(z) Stationary Source.—The term "stationary source" means generally any source of an air pollutant except those emissions resulting directly from an internal combustion engine for transportation purposes or from a nonroad engine or nonroad vehicle as defined in section 7550 of this title.

[3] 40 CFR § 1074.10 Scope of preemption. (b) For nonroad engines or vehicles other than those described in paragraph (a) of this section and § 1074.12, States and localities are preempted from enforcing any standards or other requirements relating to control of emissions from nonroad engines or vehicles except as provided in subpart B of this part.

[4] EPA 2012. "Haul Road Workgroup Final Report Submission to EPA-OAQPS." Memorandum from Tyler Fox (EPA Air Quality Modeling Group Leader) to Regional Office Modeling Contacts, March 2, 2012.

Several fugitive emissions sources are characterized as AREA sources, including wind erosion emissions at the topsoil storage locations; and general mining activity across the borrow site. For the sources whose emission location extents are not rectangular, the AREA sources are characterized as rectangular approximations of the locations.

2.4 Insignificant Sources

Categorically insignificant sources are listed in Table 2. The "Source ID" column identifies sources included in the emission inventory worksheets or characterized in Figure 2 but not considered significant TEUs. Details about each source were taken from "Grassy Mountain Project, Oregon, USA, NI 43-101 Technical Report on Feasibility Study" prepared by Ausenco (2020) unless otherwise noted.

Table 2. Categorically Insignificant Sources List

Source ID	Source Description	Details
N/A	Evaporative and tail pipe emissions from on-site motor vehicle operation	Aboveground nonroad vehicles.
N/A	Office activities	Administration building: Single level modular wood frame, 8,800 ft^2. Will be serviced with power, water, HVAC, communications. Contractor office and laydown area: Modular trailer with an area of 160 ft^2
N/A	Janitorial activities	Routine janitorial activities will be occurring as needed.
N/A	Grounds keeping activities, including but not limited to building painting and road and parking lot maintenance	Seasonal road maintenance is anticipated to be sufficient to provide initial access to the site for all personnel and any deliveries related to the mine site and construction. The road will be upgraded for year-round activities during mine construction.
N/A	Automotive storage garages	Truck workshop and warehouse: Pre-engineered steel-frame and metal-clad building with an area of 6,250 ft^2. Will be positioned adjacent to the administration building. Will be divided into two sections, one for warehousing spare parts and tool storage and the other for a maintenance workshop. A bridge crane will be included.
N/A	Refrigeration systems with less than 50 pounds of charge of ozone depleting substances regulated under Title IV	Not specifically identified but may be present
N/A	Temporary construction activities	Construction period of 18 months beginning March 1st, 2022 to build tailings storage and waste rock dump facilities
N/A	Warehouse activities	Process plant workshop and warehouse: Metal clad building approximately 2,540 ft^2.
N/A	Accidental fires and fire suppression	Fire safety systems: fire suppression, detection, and protection systems.
N/A	Electric motors	These have not been specifically identified but are anticipated to be present.
N/A	Pressurized tanks containing gaseous compounds	These have not been specifically identified but may be present in the workshop or laboratory.
N/A	Stormwater settling basins	An EPA-compliant Stormwater Pollution Prevention Plan will be in place. The portal pad was designed with a 1% inclination toward outside, to allow storm water to flow away from the portal and toward the stormwater drainage ditches.

Source ID	Source Description	Details
HR	Hazardous air pollutant emissions in fugitive dust from paved and unpaved roads, except for those sources that have processes or activities that contribute to the deposition and entrainment of hazardous air pollutants from surface soil	Borrow pit haul roads: 1.02 mi. Underground hauling: 1.62 mi. Process area hauling: 0.89 mi.
N/A	Health, safety, and emergency response activities	Two mobile emergency refuge stations will be provided in case of fire or rockfalls that would block access and prevent full evacuation of personnel. These refuges will allow the staff to remain safe in the underground mine for 48 hours. Each can accommodate up to 20 people within the protected chamber.

2.5 Coordinate System

The Universal Transverse Mercator (UTM) coordinate system projected in North American Datum of 1983 (NAD83), Zone 11, is used in the modeling analysis to define all locations in the modeling domain (sources, buildings, and receptors).

2.6 Building Downwash

The effects of the building-induced downwash are incorporated into this modeling analysis (see Figure 4 for a 3D perspective of the modeled building layout). The building downwash parameters were calculated using the Building Profile Input Program (BPIP) with the Plume Rise Model Enhancement (PRIME) algorithm (BPIP-PRIME version 04274). The building parameters used in the modeling are provided in a BPIP-ready format in 3.0Appendix B.

2.7 Receptors

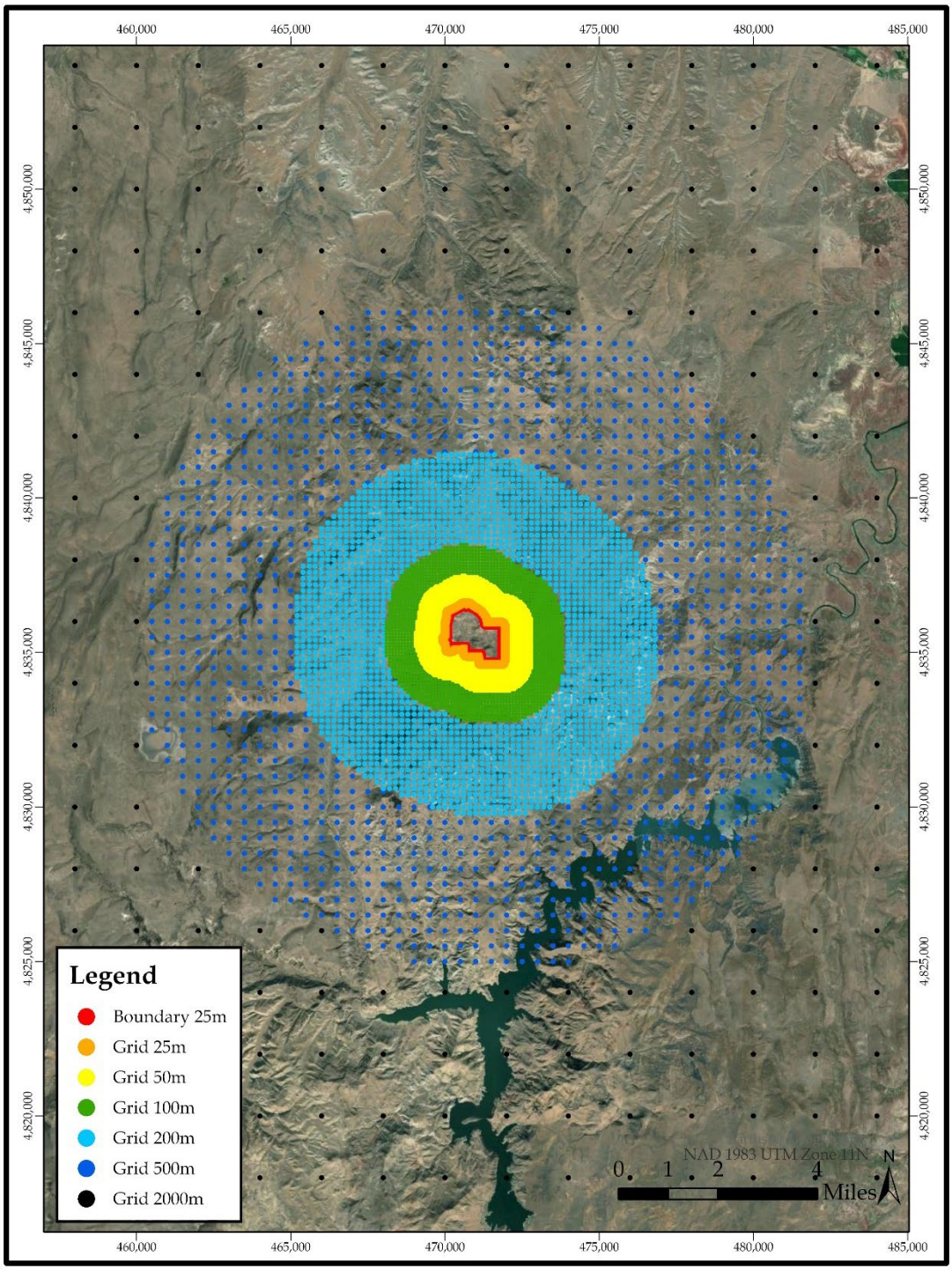
A series of nested Cartesian receptor grids were used to assess ground-level impacts from the facility air emissions:

- Boundary line receptors at 25-meter spacing
- Gridded receptors at 25-meter spacing out to 200 meters from the modeling boundary
- Gridded receptors at 50-meter spacing out to 1 kilometer from the modeling boundary
- Gridded receptors at 100-meter spacing out to 2 kilometers from the modeling boundary
- Gridded receptors at 200-meter spacing out to 5 kilometers from the modeling boundary
- Gridded receptors at 500-meter spacing to 10 kilometers from the modeling boundary
- Gridded receptors at 2-kilometer spacing to 50 kilometers from the modeling boundary

All the above grids were centered on the facility. Receptors within the project boundary were not modeled. The receptor locations are shown in Figure 5.

All receptors were processed with the AERMOD terrain preprocessor (AERMAP, version 18081) to generate receptor terrain elevations and hill height values using the one-third-arc-second (10-meter) resolution United States Geographical Survey National Elevation Dataset (NED) files.

Figure 5. Receptor Locations



2.8 Meteorological Data

The air quality modeling was conducted using one year (10/01/2014–09/30/2015) of site-specific hourly meteorological data. The meteorological data were collected at the Calico-Vale meteorological station as part of the Air Quality Baseline study for the facility project area (EM Strategies 2018). The site is located approximately four kilometers west of the facility project area, as shown in Figure 6. A wind frequency distribution diagram (wind rose) for the meteorological data is presented in Figure 7. The data quality meets or exceeds all specifications described in the EPA's Meteorological Monitoring Guidance for Regulatory Modeling Applications (EPA 2000).

The data set was processed with AERMET version 22112, supplemented with upper-air data from Boise, ID, and National Weather Service (NWS) surface station data, including cloud cover, from Ontario, OR. The processing includes the AERMET stage 3 adjusted surface friction velocity option (ADJ_U*).

Figure 6. Calico-Vale Meteorological Tower Location

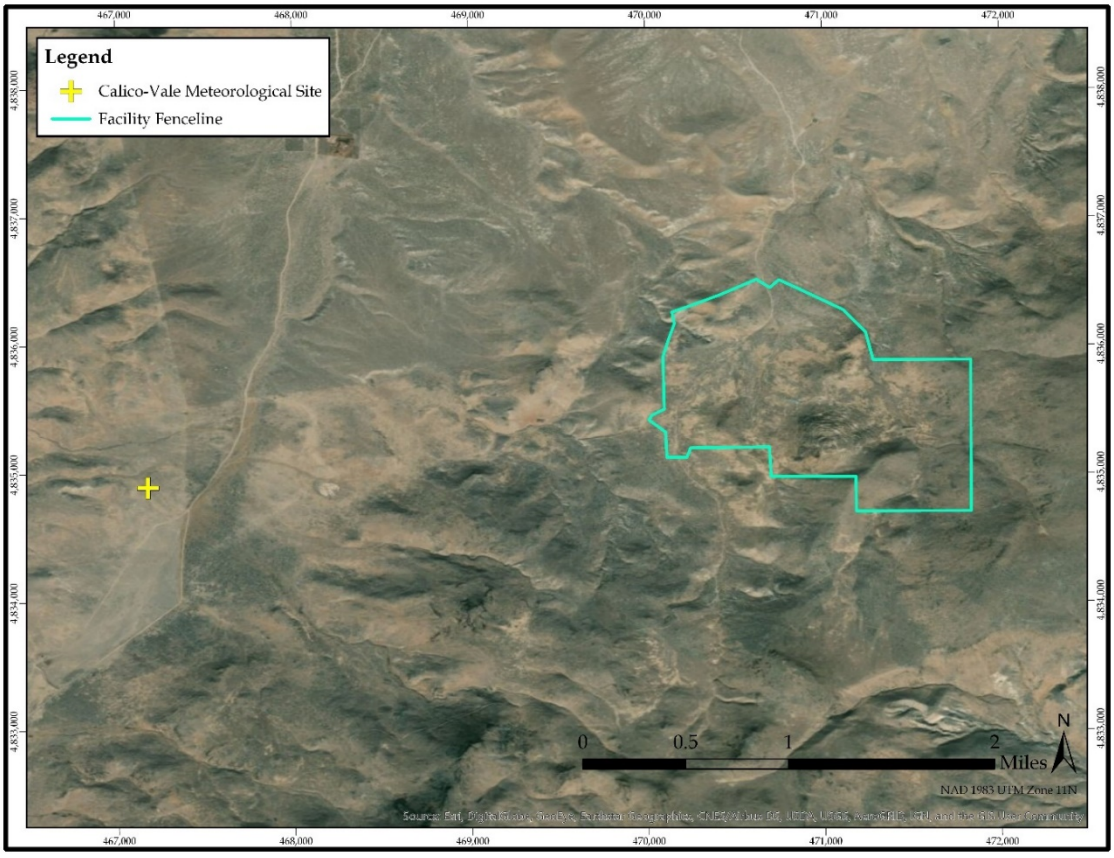
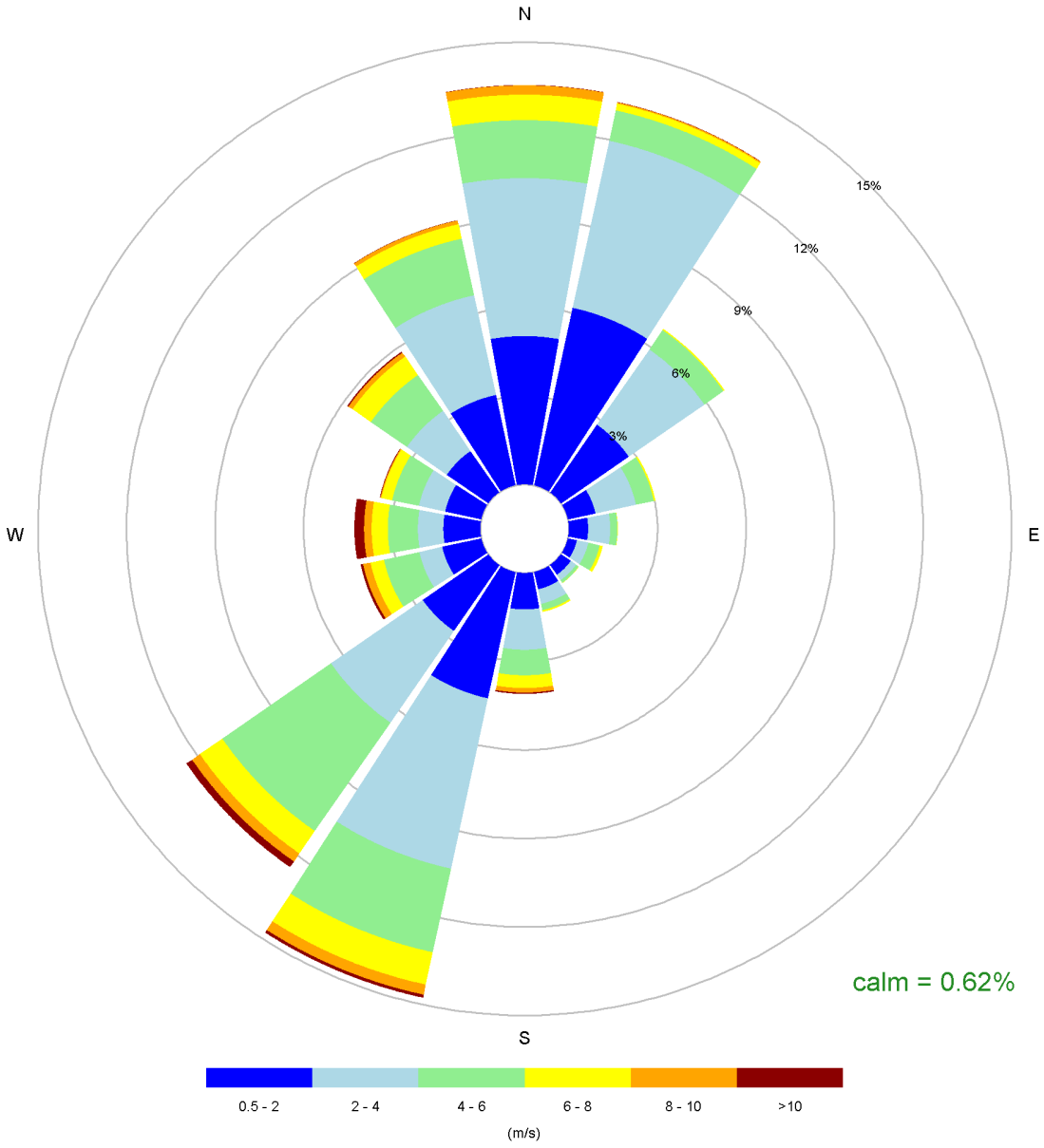


Figure 7. Wind Rose for the Calico-Vale Meteorological Station



2.9 Background Concentrations

Monitored pollutant concentrations—termed background or baseline concentrations—represent prevailing air pollution from existing sources in the region. These concentrations are added to the modeled ambient concentrations from a project's emissions to estimate the total ambient concentrations at the modeled receptors.

Calico contracted HDR, Inc. and Bison Engineering, Inc. to design, install, and operate an on-site particulate ($PM_{2.5}$ and PM_{10}) monitoring station in 2014. This on-site station collected

ambient particulate concentration data from July 2014 to September 2015 to establish background concentrations for the Grassy Mountain project. The particulate monitoring program details and data analysis are provided in "Air Quality Resources Baseline Report for the Grassy Mountain Mine Project" (EM Strategies 2018). The on-site $PM_{2.5}$ and PM_{10} design background concentrations in micrograms per cubic meter ($\mu g/m^3$) are provided in Table 3 and are used in the cumulative impact analysis.

Table 3. Grassy Mountain On-site Particulate Background Concentrations

Pollutant	Averaging Time	Form	Background Concentration ($\mu g/m^3$)	Data Period
$PM_{2.5}$	Annual	Average	4.6	October 2014–September 2015 (excluding data affected by wildfire smoke)
	24 hours	Second high	21	
PM_{10}	24 hours	Second high	23	

Source: (EM Strategies 2018)

For criteria pollutants with no on-site background data, DEQ recommends using the gridded background concentration values available through the NW-AIRQUEST online. The gridded NW-AIRQUEST background concentrations for the Grassy Mountain location are provided in Table 4; values for particulate matter were included for reference, at the request of DEQ, but will not be used in the cumulative impact analysis.[1]

Table 4. NW-AIRQUEST Design Background Concentrations for Grassy Mountain Location

Longitude (°)	Latitude (°)	NO_2 (ppb)	O_3 (ppb)	$PM_{2.5}$ ($\mu g/m^3$)	PM_{10} ($\mu g/m^3$)
		1 hr	8 hr	24 hr	24 hr
-117.396	43.653	2.62	60.69	15.85	90.92
-117.394	43.690	2.62	60.69	15.45	90.18
-117.345	43.651	2.62	60.71	15.88	85.35
-117.343	43.688	2.94	60.71	16.39	87.38
Average		2.70	60.70	15.89	88.46

2.10 Pollutants and Averaging Times

As discussed in Section 1.1, Grassy Mountain's potential air emissions trigger the Type B State NSR air quality analysis for PM_{10}. Additionally, DEQ guidance (DEQ 2022a) requires that all new facilities applying for a Simple or Standard ACDP must compare short-term emission rates

[1] https://idahodeq.maps.arcgis.com/apps/MapSeries/index.html?appid=0c8a006e11fe4ec5939804b873098dfe

with the Trial Significant Emission Thresholds (SETs) for the following short-term National Ambient Air Quality Standards (NAAQS):

- NO_2 1 hour
- $PM_{2.5}$ 24 hours
- SO_2 1 hour

If the short-term emission rate is at or above the associated SET, the facility should demonstration compliance with the NAAQS using dispersion modeling. The short-term emission rates for Grassy Mountain and their comparison with the SETs are provided in Table 5.

Table 5. Grassy Mountain Short-Term Emission Rates

Source Category	24-hour $PM_{2.5}$ (lb/day)	1-hour NO_X (lb/hr)	1-hour SO_2 (lb/hr)
Process	18.5	31.06	0.46
Mining and Fugitive	10.0	5.38	0.01
Nonroad (Underground)	5.1	3.88	0.01
Facility Total	**33.6**	**40.32**	0.48
SET	**5**	**3**	**3**

Grassy Mountain emissions exceed the SETs for 24-hour $PM_{2.5}$ and 1-hour NO_X (bold values under Facility Total). Therefore, the Type B NSR air quality analysis for Grassy Mountain includes evaluation of these pollutant and averaging times in addition to 24-hour PM_{10}. The pollutant and averaging time combinations included in the analysis are provided in Table 6.

Table 6. Modeled Pollutants and Averaging Times

Pollutant	Averaging Time	Form
NO_2	1 hour	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
$PM_{2.5}$	24 hours	98th percentile, averaged over 3 years
PM_{10}	24 hours	Not to be exceeded more than once per year on average over 3 years

2.11 Modeling Options

Default regulatory modeling options for AERMOD will be used to estimate the specific design concentrations for each pollutant and averaging time at the modeled receptor locations.

2.11.1 Conversion of NO_X to NO_2

The Ambient Ratio Method 2 (ARM2) was used for modeling the NO_X to NO_2 conversion for the Grassy Mountain air quality analysis. It is a Tier 2 approach recommended by the Environmental Protection Agency Guideline on Air Quality Models, Appendix W to Code of Federal Regulations, Title 40, Part 51.

2.11.2 Treatment of Intermittent Emissions for 1-Hour Analyses

In its guidance on NO_2 and SO_2 1-hour modeling (EPA 2011), the EPA has recognized that intermittent sources that do not operate continuously or frequently enough—specifically, emergency generators—are less likely to contribute significantly to the annual distribution of daily maximum 1-hour values. The EPA recommends "*that compliance demonstrations for the 1-hour NO_2 NAAQS be based on emission scenarios that can logically be assumed to be relatively continuous or which occur frequently enough to contribute significantly to the annual distribution of daily maximum 1-hour concentrations*" (EPA 2011).

The proposed emergency equipment at the Grassy Mountain project includes a diesel-powered emergency generator to supply power to critical operations in an event of power failure, and a fire water pump. The potential to emit for the emergency equipment is determined using the 100 hours per year allowed by the applicable regulations for maintenance and readiness testing. Emissions from the emergency engines were modeled with average hourly rates rather than the maximum hourly emissions for the 1-hour analyses. This is consistent with the EPA guidance for intermittent sources (EPA 2011).

Blasting will occur at the borrow site to produce material for backfill operations. When a blast in the borrow occurs, activity near the blasting area will necessarily cease. So, during blasting emissions, no other sources of NO_2 will be active near the blast area. Based on a decision by DEQ, the EPA guidance for intermittent sources is also applicable to the borrow blasting activities . DEQ considered the following: blasting will be performed on an as-needed basis to produce the rock; the agency's experience with Monte Carlo analyses for this type of activity; and the project's remote location. Therefore, the emissions from the blasting were modeled with an average hourly emission rate rather than the maximum hourly emission rate for the NO_2 1-hour modeling analyses. This is consistent with EPA guidance for intermittent sources (EPA 2011).

2.12 Modeling Scope

Typically, the scope of an NSR air quality modeling analysis is determined by comparing the single source impacts with the applicable Significant Impact Levels (SIL). Modeling the Grassy Mountain project emissions would reasonably result in concentrations higher than the SIL, so the single source impact step was bypassed in favor of completing the NAAQS Cumulative Impact Analysis.

2.13 NAAQS Cumulative Impact Analysis

The NSR air quality analysis includes AERMOD dispersion modeling to demonstrate compliance with the NAAQS provided in Table 7.

Table 7. NAAQS for Compliance Demonstration

Pollutant	Averaging Time	NAAQS		Form
		(ppb)	(µg/m³)	
NO_2	1 hour	100	188	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
$PM_{2.5}$	24 hours	--	35	98th percentile, averaged over 3 years
PM_{10}	24 hours	--	150	Not to be exceeded more than once per year on average over 3 years

The AERMOD dispersion modeling for the Grassy Mountain NAAQS cumulative impact analysis only includes emissions from the Grassy Mountain sources. DEQ determined that there were no significant competing sources to include in the cumulative modeling, due to the Grassy Mountain project's remote location (DEQ 2022b).

Design background concentrations were added to the highest modeled cumulative design concentrations to estimate total cumulative concentrations. Total cumulative concentrations were compared with NAAQS for compliance demonstration. The design background concentrations are provided in Table 8.

Table 8. Background Concentrations

Pollutant	Averaging Time	Background Concentration		Reference
		(ppb)	(µg/m³)	
NO_2	1 hour	2.70	5	NW-AIRQUEST average, Table 4
$PM_{2.5}$	24 hours	--	21	On-site, Table 3
PM_{10}	24 hours	--	23	On-site, Table 3

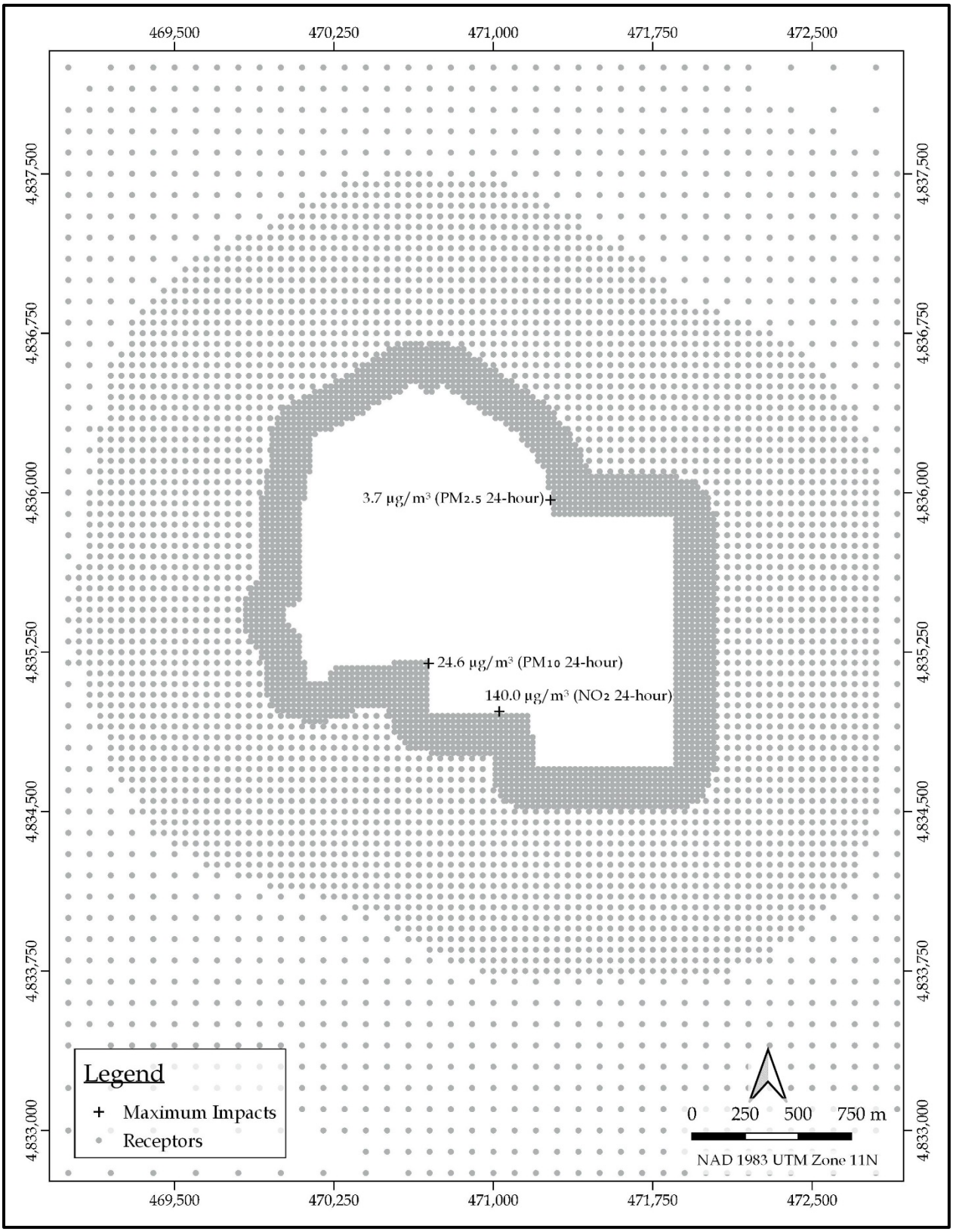
The AERMOD dispersion cumulative impact modeling results and their comparison to the NAAQS are presented in Table 9.

Table 9. AERMOD Cumulative Impact Results and Compliance Demonstration

Pollutant	Averaging	Background Concentration (µg/m³)	Modeled Impact (µg/m³)	Total Impact (µg/m³)	NAAQS (µg/m³)	Compliance
NO_2	1-Hour	5	140.0	145.0	188	Yes
$PM_{2.5}$	24-Hour	21	3.7	24.7	35	Yes
PM_{10}	24-Hour	23	24.6	47.6	150	Yes

The locations of the maximum modeled primary impacts are shown in Figure 8.

Figure 8. Maximum Modeled Impact Locations



2.14 Modeled Emission Rates for Precursors (MERPs) Analysis

Unlike the other criteria pollutants, ground-level O_3 is not directly emitted from industrial sources; it is a secondary pollutant formed through photochemical reactions driven predominantly by the emissions of NO_X and VOC in the presence of sunlight. O_3 formation is a complicated, nonlinear process that depends on meteorological conditions in addition to NO_X and VOC concentrations. Warm temperatures, clear skies (i.e., abundant levels of solar radiation), and stagnant air masses (low wind speeds) increase the potential for O_3 formation (EPA 2016).

The O_3 impacts from the Grassy Mountain project's potential O_3 precursor emissions were evaluated using the Tier 1 approach provided in EPA's single-source O_3 and secondary $PM_{2.5}$ guidance (EPA 2016). This approach involves estimating the O_3 concentration resulting from the Grassy Mountain project's potential O_3 precursor emissions via the scaling of representative hypothetical source (RHS) precursor emissions and corresponding resultant O_3 concentrations as follows:

$$Grassy\ Mountain\ O_3\ 8-Hour\ Maximum\ Impact$$
$$= \frac{RHS\ O_3\ 8-Hour\ Maximum\ Impact\ (from\ NO_X) \times Grassy\ Mountain\ NO_X\ Emissions}{RHS\ NO_X\ Emissions}$$
$$+ \frac{RHS\ O_3\ 8-Hour\ Maximum\ Impact\ (from\ VOC) \times Grassy\ Mountain\ VOC\ Emissions}{RHS\ VOC\ Emissions}$$

The MERPs Tier 1 analysis for the Grassy Mountain project uses the Morrow site near Arlington on the Columbia River as an RHS. The Morrow site is considered the most conservative RHS for MERPs Tier 1 analysis in Oregon by DEQ (DEQ 2022a). Results of the MERPs Tier 1 analysis are presented in Table 10. Note that Grassy Mountain project emission rates for the precursors in the analysis represent the project's short-term emission rates converted to ton per year.

Table 10. Maximum O_3 8-hour Concentration and Compliance Demonstration

Source	NO_X Emissions (ton/yr)	O_3 from NO_X Precursors (ppb)	VOC Emissions (ton/yr)	O_3 from VOC Precursors (ppb)
RHS	500	1.94	500	0.46
Grassy Mountain	21.3	0.08	12.2	0.01
Grassy Mountain 8-hour O_3 Concentration (ppb)				0.09
NAAQS Compliance Demonstration				
Significant Impact Level (SIL) (ppb)				1
Grassy Mountain Impact < SIL				Yes

Like O_3, $PM_{2.5}$ can be formed indirectly as a result of NOx and SO_2 emissions interacting with other chemicals in the downwind atmosphere to form fine particles. Direct $PM_{2.5}$ concentrations

from the Grassy Mountain project $PM_{2.5}$ emissions were estimated using AERMOD and are provided in Section 2.13. To evaluate the secondary $PM_{2.5}$ impacts from the $PM_{2.5}$ precursor emissions, a Tier 1 assessment similar to the O_3 Tier 1 assessment was performed using the following equations:

$$Grassy\ Mountain\ PM_{2.5}\ \ 24-Hour\ Maximum\ Impact$$
$$= \frac{RHS\ PM_{2.5}\ 24-Hour\ Maximum\ Impact\ (from\ NO_X) \times Grassy\ Mountain\ NO_X\ Emissions}{RHS\ NO_X\ Emissions}$$
$$+ \frac{RHS\ PM_{2.5}\ 24-Hour\ Maximum\ Impact\ (from\ SO_2) \times Grassy\ Mountain\ SO_2\ Emissions}{RHS\ SO_2\ Emissions}$$

$$Grassy\ Mountain\ PM_{2.5}\ \ Annual\ Maximum\ Impact$$
$$= \frac{RHS\ PM_{2.5}\ Annual\ Maximum\ Impact\ (from\ NO_X) \times Grassy\ Mountain\ NO_X\ Emissions}{RHS\ NO_X\ Emissions}$$
$$+ \frac{RHS\ PM_{2.5}\ Annual\ Maximum\ Impact\ (from\ SO_2) \times Grassy\ Mountain\ SO_2\ Emissions}{RHS\ SO_2\ Emissions}$$

The applicable existing $PM_{2.5}$ ambient background concentrations and the primary $PM_{2.5}$ concentrations were added to the estimated Grassy Mountain secondary $PM_{2.5}$ maximum impacts to calculate the total $PM_{2.5}$ concentrations for comparison with the NAAQS. Results of the MERPs calculations are presented in Table 11. Note that Grassy Mountain project emission rates for the precursors in the analysis represent the project's short-term emission rates converted to ton per year.

Table 11. Maximum Secondary $PM_{2.5}$ Impacts

Source/Parameter	NO_X Emissions (ton/yr)	$PM_{2.5}$ from NOx (μg/m³)	SO_2 Emissions (ton/yr)	$PM_{2.5}$ from SO_2 (μg/m3)
RHS - 24-hour	500	0.2	500	0.25
Grassy Mountain - 24-hour	21.3	0.0085	1.0	0.0005
$PM_{2.5}$ 24-Hour Secondary Impact				0.0090

To demonstrate compliance with the $PM_{2.5}$ NAAQS, the primary, secondary, and background $PM_{2.5}$ concentrations were summed then compared to the NAAQS, as shown in Table 12.

Table 12. Maximum Secondary PM2.5 Compliance Demonstration

Pollutant	Averaging Time	Background Concentration ($\mu g/m^3$)	Primary Impact ($\mu g/m^3$)	Secondary Impact ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Compliance
$PM_{2.5}$	24-Hour	21	3.6579	0.0090	24.6669	35	Yes

2.15 PSD Increment Cumulative Analysis

All sources located in Class II areas are required to perform an air quality analysis for Class II PSD Increments (DEQ 2022a). The modeling for the Grassy Mountain cumulative Class II PSD Increment analysis includes the Grassy Mountain project's potential emissions along with actual emissions from nearby permitted sources based on the competing source inventory obtained from DEQ.

The Class II air quality analysis includes AERMOD dispersion modeling to demonstrate compliance with the PSD Increments (OAR 340-202-0210(1)(b)) provided in Table 13.

Table 13. Class II PSD Increment Results and Compliance Demonstration

Pollutant	Averaging Time	Form of Primary Impact	Primary Impact ($\mu g/m^3$)	Secondary Impact ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Class II PSD Increment ($\mu g/m^3$)	Compliance
$PM_{2.5}$	24-Hour	High 2nd High	4.4	n/a	4.4	9	Yes
PM_{10}	Annual	High 2nd High	2.2119	0.0090	2.2209	17	Yes
PM_{10}	24-Hour	High 2nd High	24.6	n/a	24.6	30	Yes

2.16 Analysis of Class I Area Impacts

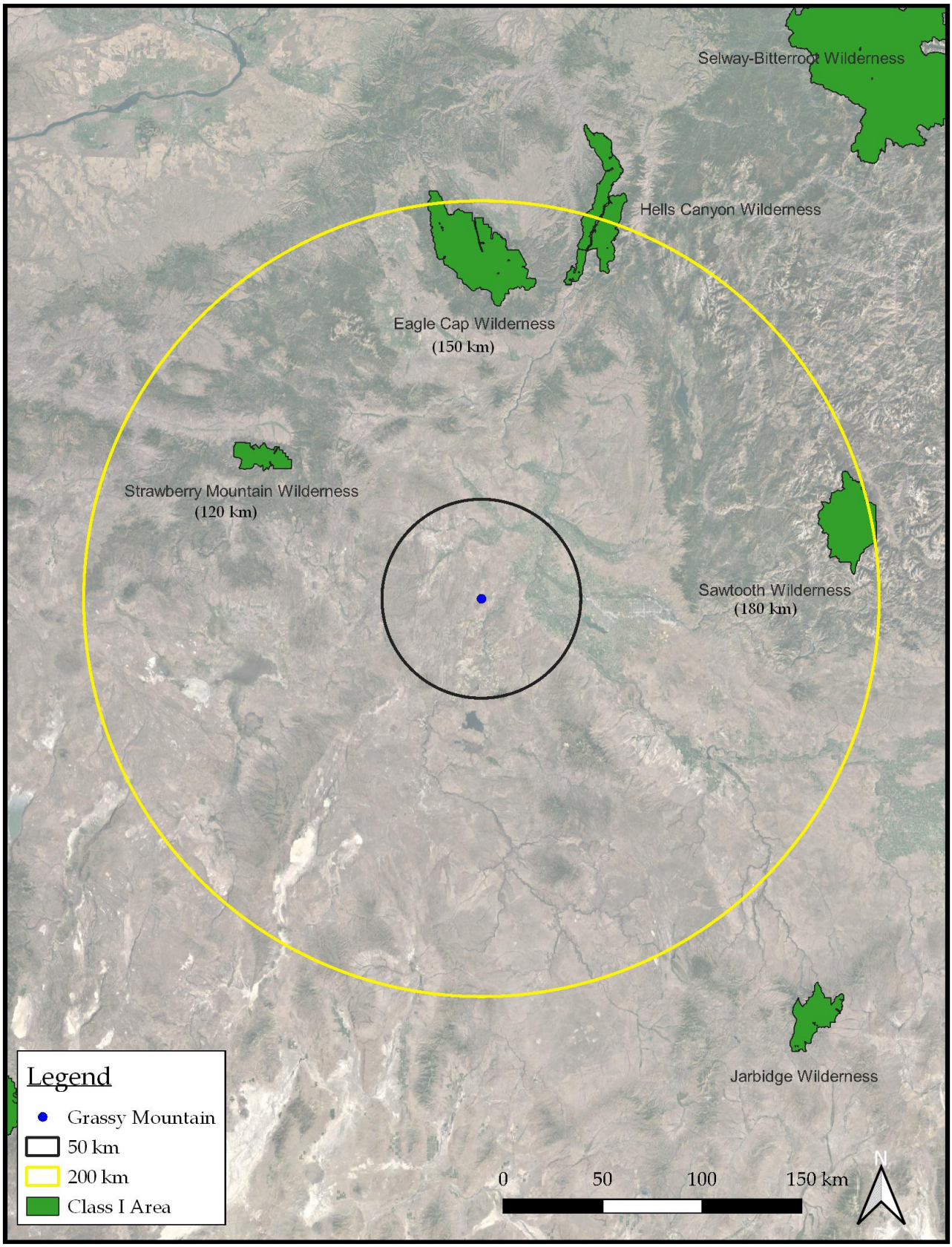
The DEQ modeling guidance (DEQ 2022a) recommends that all sources within 200 kilometers (km) of a Class I area provide an air quality analysis for Class I PSD increments. The Grassy Mountain project location with reference to Class I areas in the region is presented in Figure 9.

This figure shows that the closest Class I area to the Grassy Mountain project is the Strawberry Mountain Wilderness, approximately 120 km to the northwest. A Class I screening (emissions over distance, i.e., Q/D) analysis following the Federal Land Managers' Air Quality Related Values Work Group guidance (NPS 2010) is provided for the Strawberry Mountain Wilderness Class I area in Table 14.

Table 14. Q/D Analysis for Strawberry Mountain Class I Area

AQRV Pollutant Emissions (Q) (lb/day)	(ton/yr)	Strawberry Mountain Distance (D) (km)	Q/D (ton/yr-km)	Q/D < 10
228	42	120	0.3	Yes

Figure 9. Class I Areas and Grassy Mountain Project



2.17 Additional Impact Analysis

Demonstrating compliance with the secondary NAAQS is considered a surrogate for impacts on soils, vegetation, and visibilty. The secondary standards were developed to provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. The secondary standards are always either equal to or greater than the corresponding primary standards (i.e., less stringent); therefore, showing compliance with the primary standards (see Section 2.13) also demonstrates compliance with the secondary standards.

2.18 Environmental Justice Analysis

Social and community impacts have been and are being considered and evaluated for the various Grassy Mountain project's Plan of Operation (PoO) amendments performed in accordance with the National Environmental Policy Act (NEPA) and other federal laws, as well as the State of Oregon's Office of Economic Analysis forecasts. Potentially affected Native American tribes, tribal organizations, and individuals are consulted during the preparation of all PoO amendments to understand the impact that the project may have on cultural sites, resources, and traditional activities.

Calico does not expect significant changes to general commercial, residential, and other growth due to the Grassy Mountain project. However, the project-related socio-economic issues, including employment, payroll, services and supply purchases, and state and local tax payments are expected to be positive.

3.0 REFERENCES

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Appendix A – BPIPPRM Building Parameters

Buildings dimensions were based on the planned facility layout. The formatted BPIP-Prime text file that includes building information is included in the digital attachment link below.

The attachment contains all files needed to run AERMOD 22112, in addition to Microsoft Excel worksheets detailing all emissions inventory calculations.

https://ftps.airsci.com/?ShareToken=D96DC9BF9A4E8D0C31AED462D319ABEA495AA1CA